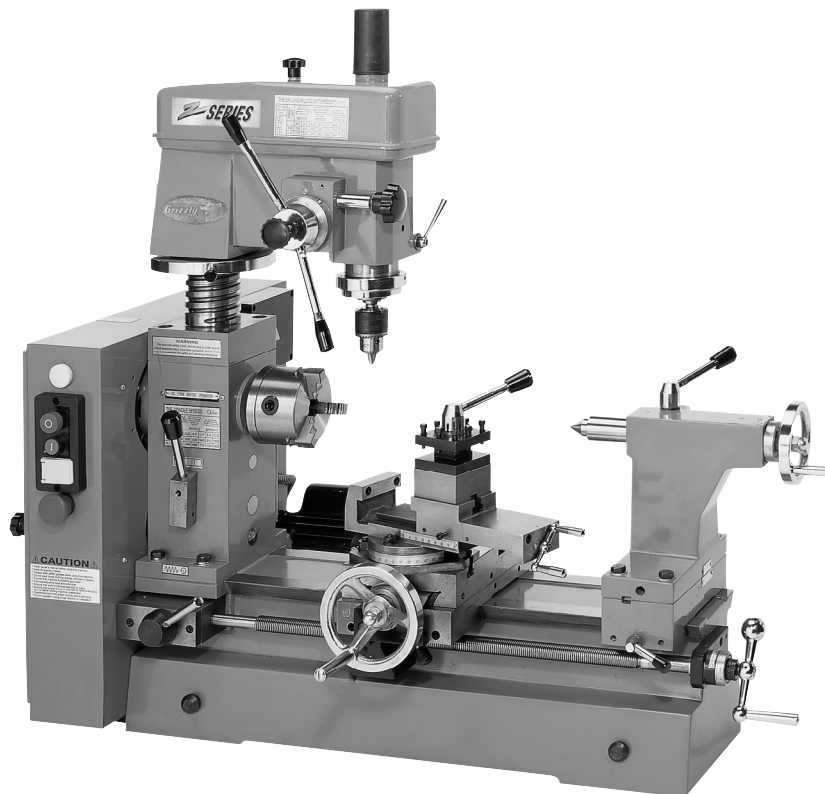


Grizzly ***Industrial, Inc.***®

MODEL G4015Z COMBINATION LATHE/MILL OWNER'S MANUAL



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**WARNING: NO PORTION OF THIS MANUAL MAY BE REPRODUCED IN ANY SHAPE
OR FORM WITHOUT THE WRITTEN APPROVAL OF GRIZZLY INDUSTRIAL, INC.**
#DD3737 PRINTED IN CHINA

WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance and service of this machine/equipment.

Failure to read, understand and follow the instructions given in this manual may result in serious personal injury, including amputation, electrocution or death.

The owner of this machine/equipment is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, blade/cutter integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

Table Of Contents

	PAGE
1. SAFETY	
SAFETY RULES FOR POWER TOOLS	2-3
ADDITIONAL SAFETY INSTRUCTIONS FOR LATHE/MILLS	4
2. CIRCUIT REQUIREMENTS	
110V OPERATION	5
EXTENSION CORDS	5
GROUNDING	6
3. INTRODUCTION	
COMMENTARY	7
UNPACKING	8
PIECE INVENTORY	8
LIFTING	9
CLEAN UP	10
SITE CONSIDERATIONS	10
4. IDENTIFICATION	
MACHINE TERMS.....	11
5. ASSEMBLY & SETUP	
HANDWHEEL	12
HAND CRANK	12-13
LATHE CHUCK	13
LATHE CHUCK REMOVAL	14-15
DEAD CENTER.....	16
TOOL POST	17
DRILL CHUCK.....	18
DRILL CHUCK REMOVAL	18
DRILL PRESS MOUNTING.....	19
LATHE MOUNTING.....	19
MACHINE VISE.....	20
6. LATHE CONTROLS	
LATHE SPEEDS	21
FEED SELECTION	22
FEED LEVER	22
HALF NUT	23
CARRIAGE CONTROLS	23-24
TAILSTOCK CONTROLS	24
7. DRILL PRESS CONTROLS	
DRILL PRESS SPEEDS	25-26
FINE DOWN FEED	26
8. ADJUSTMENTS	
GIBS.....	27-28
HEAD STOCK	28
TAILSTOCK	29-30
9. OPERATIONS	
CONTROL PANEL	31
TEST RUN.....	32
READING THE CHARTS	33
FEED RATES	33
CHANGING GEARS.....	34-35
INCH THREADING.....	36-37
POWER FEED	38
10. MAINTENANCE	
LUBRICATION	39-40
BEARING PRELOAD	40
11. CLOSURE	41
MACHINE DATA	42
YOUR NOTES.....	43
PARTS BREAKDOWN AND PARTS LISTS	44-57
WARRANTY AND RETURNS	58

SECTION 1: SAFETY

WARNING

For Your Own Safety Read Instruction Manual Before Operating This Equipment

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words which are intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.



Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

This symbol is used to alert the user to useful information about proper operation of the equipment.

WARNING

Safety Instructions For Power Tools

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning on.
3. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
4. **NEVER USE IN DANGEROUS ENVIRONMENT.** Do not use power tools in damp or wet locations, or where any flammable or noxious fumes may exist. Keep work area well lighted.
5. **KEEP CHILDREN AND VISITORS AWAY.** All children and visitors should be kept a safe distance from work area.
6. **MAKE WORKSHOP CHILD PROOF** with padlocks, master switches, or by removing starter keys.
7. **NEVER FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
8. **USE RIGHT TOOL.** Do not force tool or attachment to do a job for which it was not designed.

WARNING

Safety Instructions For Power Tools

- 9. USE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. Conductor size should be in accordance with the chart below. The amperage rating should be listed on the motor or tool nameplate. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Your extension cord must also contain a ground wire and plug pin. Always repair or replace extension cords if they become damaged.

Minimum Gauge for Extension Cords

AMP RATING	LENGTH		
	25ft	50ft	100ft
0-6	18	16	16
7-10	18	16	14
11-12	16	16	14
13-16	14	12	12
17-20	12	12	10
21-30	10	10	No

- 10. WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
- 11. ALWAYS USE SAFETY GLASSES.** Also use face or dust mask if cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
- 12. SECURE WORK.** Use clamps or a vise to hold work when practical. It's safer than using your hand and frees both hands to operate tool.
- 13. DO NOT OVER-REACH.** Keep proper footing and balance at all times.
- 14. MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

- 15. USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury.

- 16. REDUCE THE RISK OF UNINTENTIONAL STARTING.** On machines with magnetic contact starting switches there is a risk of starting if the machine is bumped or jarred. Always disconnect from power source before adjusting or servicing. Make sure switch is in OFF position before reconnecting.

- 17. CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

- 18. NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Do not leave tool until it comes to a complete stop.

- 19. NEVER OPERATE A MACHINE WHEN TIRED, OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Full mental alertness is required at all times when running a machine.

- 20. NEVER ALLOW UNSUPERVISED OR UNTRAINED PERSONNEL TO OPERATE THE MACHINE.** Make sure any instructions you give in regards to machine operation are approved, correct, safe, and clearly understood.

- 21. IF AT ANY TIME YOU ARE EXPERIENCING DIFFICULTIES** performing the intended operation, stop using the machine! Then contact our service department or ask a qualified expert how the operation should be performed.

WARNING

Additional Safety Instructions For Lathe/Mills

1. **MAKE SURE ALL GUARDS** are in place and that the lathe/mill sits on a flat, stable surface.
2. **BEFORE STARTING THE MACHINE** be certain the workpiece has been properly engaged in the chuck and tailstock center (if in use) and that there is adequate clearance for full rotation.
3. **ADJUST TOOL HOLDER** to provide proper support for the turning tool you will be using. Test tool holder clearance by rotating workpiece by hand before turning lathe on.
4. **SELECT THE TURNING SPEED** which is appropriate for the type of work and material. Allow the lathe to gain its full speed before beginning a cut.
5. **NEVER CHANGE FEED RATE** or spindle speeds while the lathe is in motion.
6. **NEVER REVERSE MOTOR DIRECTION** while the lathe/mill is in motion.
7. **DO NOT STOP LATHE USING YOUR HAND** against the workpiece or chuck.
8. **DO NOT LEAVE LATHE/MILL RUNNING UNATTENDED** for any reason.
9. **NEVER OPERATE THE LATHE/MILL WITH DAMAGED OR WORN PARTS.** Maintain your lathe/mill in proper working condition. Perform routine inspections and maintenance promptly when called for. Put away adjustment tools after use.
10. **MAKE SURE LATHE/MILL IS TURNED OFF**, disconnected from its power source and all moving parts have come to a complete stop before starting any inspection, adjustment, or maintenance procedure.
11. **KEEP LOOSE CLOTHING ARTICLES** such as sleeves, belts or jewelry items away from the lathe and drill spindles.
12. **ALWAYS USE THE PROPER CUTTING TOOLS** for the material you are turning, make certain they are sharp and that they are held firmly in the tool holder.
13. **ALWAYS PLACE A BOARD OR PIECE OF PLYWOOD ACROSS THE BEDWAY** when removing or installing chucks to avoid the possibility of a finger pinch occurring between a loose chuck and the edges of the bedway.
14. **NEVER LEAVE A CHUCK KEY IN THE DRILL CHUCK OR LATHE CHUCK.**

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment or poor work results.

WARNING

Like all power tools, there is danger associated with the Model G4015Z Lathe/Mill. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this tool with respect and caution to lessen the possibility of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

SECTION 2: CIRCUIT REQUIREMENTS

110V Operation

The Model G4015Z Lathe/Mill is wired for 110 volt, single phase operation. The $\frac{3}{4}$ H.P. motor will safely draw 8.7 amps at 110V. A 10-amp fuse or circuit breaker should be used when connecting this combination lathe/mill to power. Circuit breakers rated any higher are not adequate to protect the circuit. Always check to see if the wires in the circuit are capable of handling a 8.7 amp load. If you are unsure, consult a qualified electrician.


If you operate this lathe/mill on any circuit that is already close to its capacity, it might blow a fuse or trip a circuit breaker. However, if an unusual load does not exist and a power failure still occurs, contact a qualified electrician or our service department.



Extension Cords

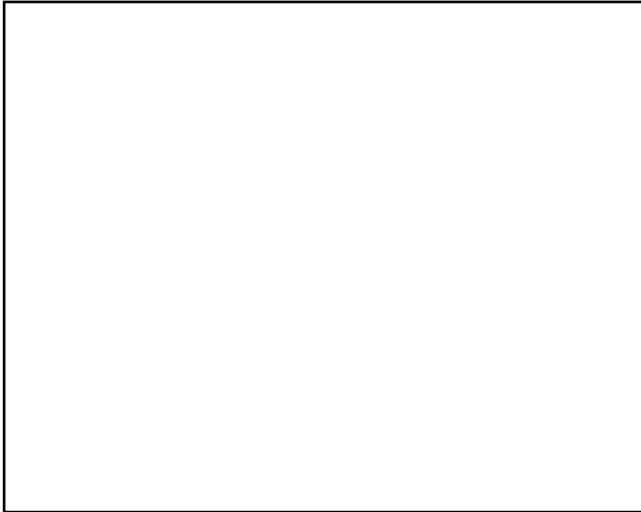
If you find it necessary to use an extension cord with the Model G4015Z, make sure the cord is rated Hard Service (grade S) or better. Refer to the chart in the standard safety instructions to determine the minimum gauge for the extension cord. The extension cord must also contain a ground wire and plug pin. Always repair or replace extension cords when they become worn or damaged.



	<p>!WARNING</p> <p>Potential for electrical shock hazard, this equipment must be grounded. Verify that any existing electrical outlet and circuit you use are actually grounded. If not, it will be necessary to run a separate 12 A.W.G. copper grounding wire from the outlet to a known ground. If not grounded properly, serious personal injury may occur.</p>
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Grounding

In the event of an electrical short, grounding reduces the risk of electric shock by providing a path of least resistance to disperse electric current. This tool is equipped with a power cord having an equipment-grounding conductor. **See Figure 1.** The outlet must be properly installed and grounded in accordance with all local codes and ordinances.



Never remove the grounding pin from any plug.

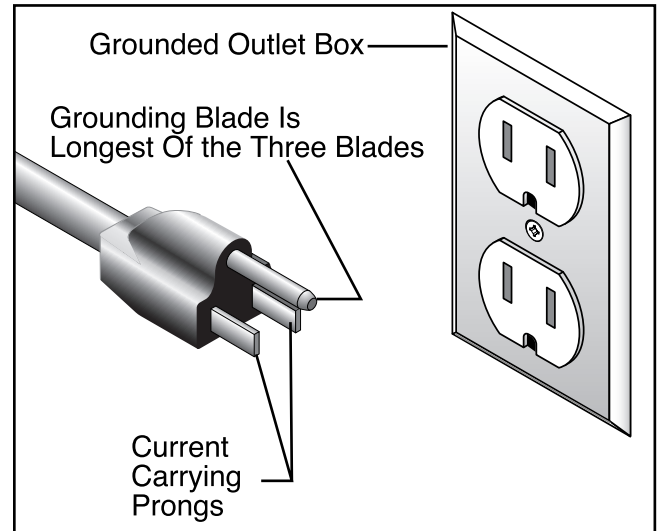


Figure 1. Typical 110V plug and outlet.



SECTION 3: INTRODUCTION

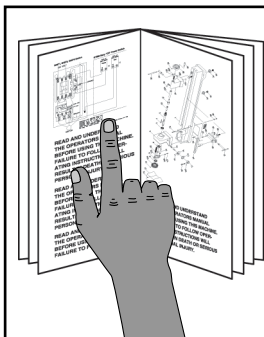
Commentary

We are proud to offer the Model G4015Z Lathe/Mill. The Model G4015Z is part of a growing Grizzly family of fine metalworking machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The Model G4015Z is a precision metalworking lathe/mill. The lathe features a 16½" swing, 19.2" between centers and 6 speeds ranging from 185 to 1455 R.P.M. The milling portion of the machine features a swing of 12", 14 speeds ranging from 117 to 1300 R.P.M. and a vise with a 2¾" capacity. The electrical package consists of a ¾ H.P., 110V motor, reversing switch and cord set.

We are also pleased to provide this manual with the Model G4015Z. It was written to guide you through assembly, review safety considerations, and cover general operating procedures. It represents our effort to produce the best documentation possible. If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
c/o Technical Documentation
P.O. Box 2069
Bellingham, WA 98227-2069



! WARNING

Read the manual before assembly and operation. Serious personal injury may result if safety or operational information is not understood or followed.

Most importantly, we stand behind our machines. If you have any service questions or parts requests, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Pennsdale, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com
Web Site: <http://www.grizzly.com>

The specifications, drawings, and photographs illustrated in this manual represent the Model G4015Z as supplied when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. Whenever possible, though, we send manual updates to all owners of a particular tool or machine. Should you receive one, we urge you to insert the new information with the old and keep it for reference.

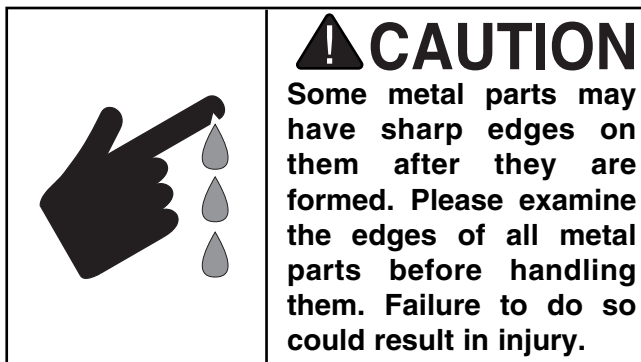
! CAUTION

To operate this, or any power tool, safely and efficiently, it is essential to become as familiar with its characteristics as possible. The time you invest before you begin to use your Model G4015Z will be time well spent. DO NOT operate this machine until you are completely familiar with the contents of this manual. Make sure you read and understand all of the safety procedures. If you do not understand something, DO NOT operate the machine.



Unpacking

This combination lathe/mill is shipped from the manufacturer in a carefully packed crate. If you discover the machine is damaged after you've signed for delivery, and the truck and driver are gone, you will need to file a freight claim with the carrier. Save the containers and all packing materials for possible inspection by the carrier or its agent. Without the packing materials, filing a freight claim can be difficult. If you need assistance determining whether you need to file a freight claim, or with the procedure to file one, please contact our Customer Service.



When you are completely satisfied with the condition of your shipment, you should inventory its parts.



Piece Inventory

The Model G4015Z is, for the most part, pre-assembled at the factory. Inside the crate you'll find:

- The Model G4015Z Combination Lathe/Mill
- 6 mm Allen® Wrench
- 5 mm Allen® Wrench
- 4 mm Allen® Wrench
- 3 mm Allen® Wrench
- Open End Wrench
- 24T Gear
- 25T Gear
- 27T Gears
- 30T Gear
- 33T Gear
- 36T Gear
- 42T Gear
- 48T Gear
- 60T Gear
- 72T Gear
- 120T Gear
- 125/127T Combination Gear
- 120/60T Combination Gear
- Lathe Chuck Key
- Drill Chuck (Installed)
- Drill Chuck Arbor (Installed)
- Drill Chuck Key
- 3 Outside Jaws
- (2) MT #3 Centers
- Knock Out Wedge
- Handle
- Hand Crank

In the event that any non-proprietary parts are missing (e.g. a nut or a washer), we would be glad to replace them, or, for the sake of expediency, replacements can be obtained at your local hardware store.



Lifting Machine

The Model G4015Z requires the use of lifting equipment such as a fork lift, engine hoist or boom crane. **Do Not** lift the machine by hand. See the warning at the right. Used in conjunction with lifting straps and following safe lifting procedures as detailed by the manufactures of these lifting devices, the lathe/mill can be safely lifted off of the pallet and placed on a sturdy work bench.

Do Not lift the machine from any other points than those pictured in **Figure 2**.

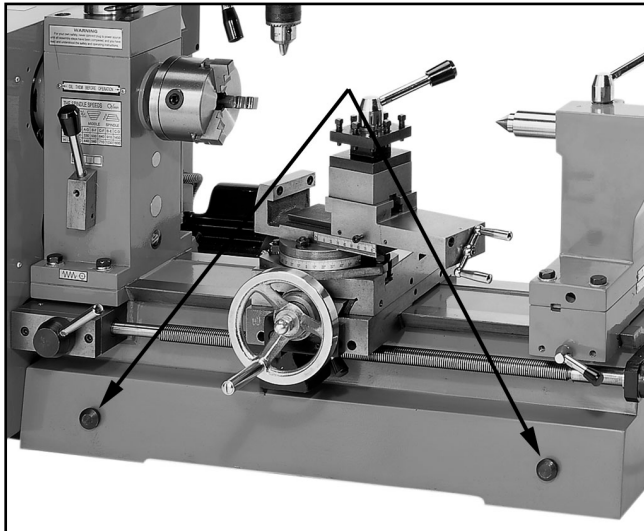
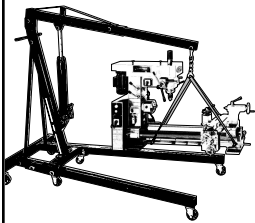
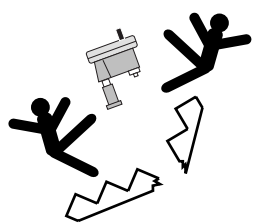


Figure 2. Use only these lifting points.



	<p>! WARNING</p> <p>The Model G4015Z is a heavy machine, 440 lbs. shipping weight. DO NOT move the machine by yourself – you will need assistance and power equipment. Serious personal injury may occur if safe moving methods are not followed.</p>
--	---

	<p>! WARNING</p> <p>If moving this machine up or down stairs, the machine must be dismantled and moved in smaller pieces. Make sure floor and stair structures are capable of supporting the combined weight of the machine parts and the people moving them.</p>
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Clean Up

The unpainted surfaces are coated with a waxy oil to protect them from corrosion during shipment. Remove this protective coating with a solvent cleaner or citrus-based degreaser, like Grizzly's G7895 Citrus Engine Degreaser. Avoid chlorine-based solvents as they may damage painted surfaces should they come in contact. Always follow the usage instructions on the product you choose for clean up.



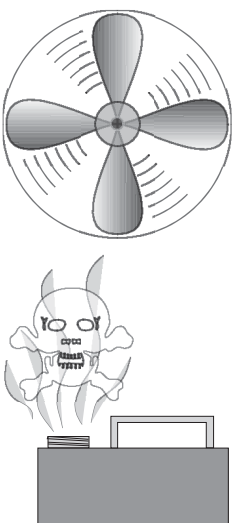
! WARNING

Do not use gasoline or other petroleum-based solvents to clean with. They have low flash points which make them extremely flammable. A risk of explosion and burning exists if these products are used. Serious personal injury may occur.



! WARNING

Do not smoke while using solvents. A risk of explosion or fire exists and may result in serious personal injury.



! CAUTION

Many of the solvents commonly used to clean machinery can be toxic when inhaled or ingested. Always work in well-ventilated areas far from potential ignition sources when dealing with solvents. Use care when disposing of waste rags and towels to be sure they do not create fire or environmental hazards.

Site Considerations

FLOOR AND WORKBENCH LOAD

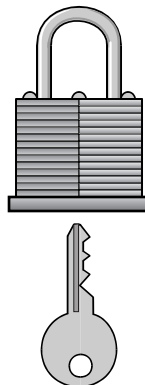
Your Model G4015Z represents a large weight load in a 18" x 36 $\frac{3}{4}$ " footprint. Most commercial or garage shop floors should be sufficient to carry the weight. **Before** moving the Lathe/Mill onto a residential floor, inspect it carefully to determine that it will be sufficient to carry the load of the machine, the device for moving it and its operators. If you question the strength of your floor, you should consider having it inspected for possible reinforcement. The workbench the machine rests on should be strong and stable enough to hold the weight of the machine and the workpiece to be turned.

WORKING CLEARANCES

Working clearances can be thought of as the distances between machines and obstacles that allow safe operation of every machine without limitation. Consider existing and anticipated machine needs, size of material to be processed through each machine, and space for auxiliary stands and/or work tables. Also consider the relative position of each machine to one another for efficient material handling.

LIGHTING AND OUTLETS

Lighting should be bright enough to eliminate shadow and prevent eye strain. Electrical circuits should be dedicated or large enough to handle amperage requirements. Outlets should be located near each machine so power or extension cords are clear of high-traffic areas. Observe local electrical codes for proper installation of new lighting, outlets, or circuits.



! CAUTION

Make your shop "child safe." Ensure that your workplace is inaccessible to youngsters by closing and locking all entrances when you are away. Never allow visitors in your shop when assembling, adjusting or operating equipment.

SECTION 4: IDENTIFICATION

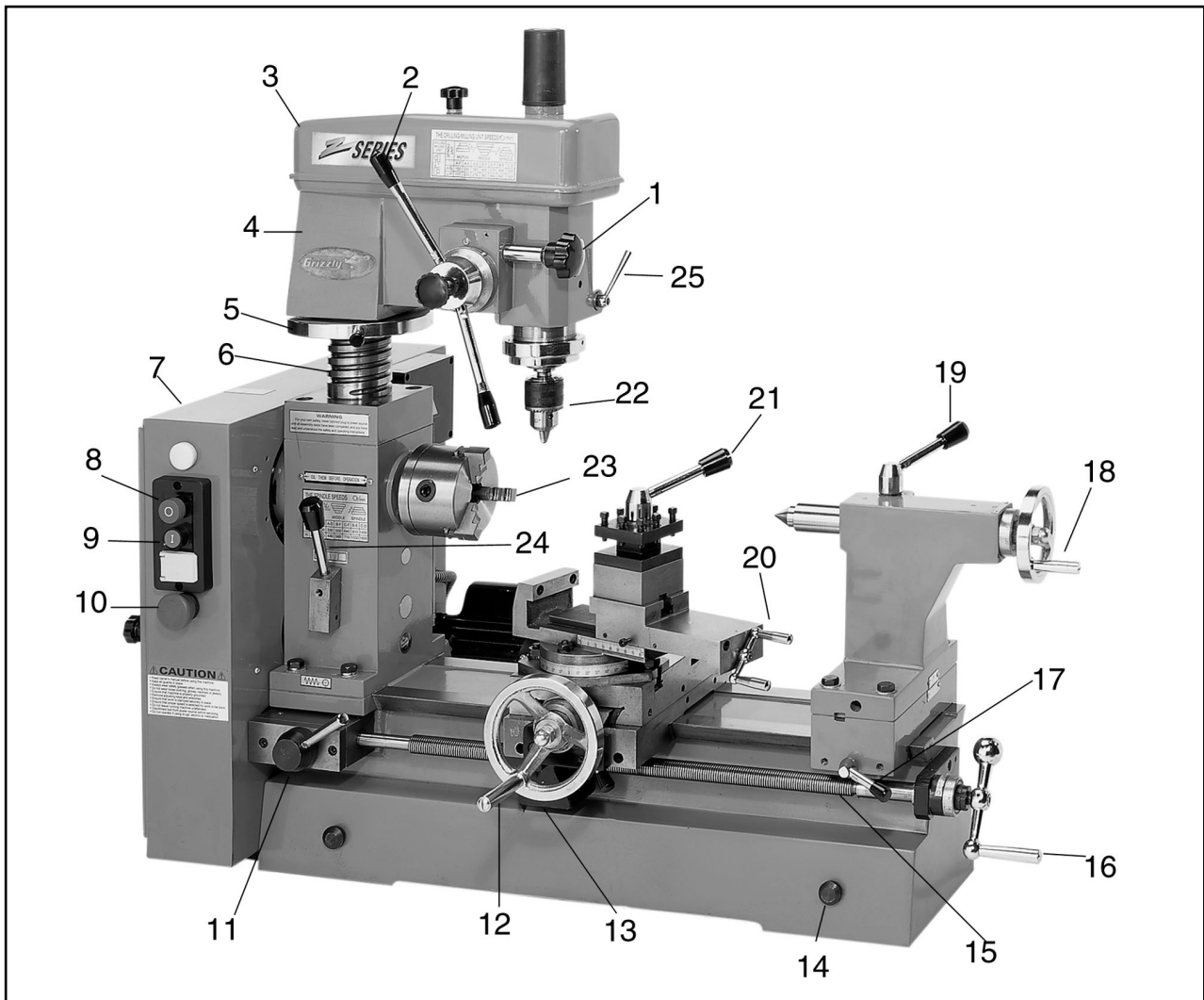


Figure 3. The following is a list of controls and components on the Model G4015Z. Please take time to become familiar with each term and its location. These terms will be used throughout the manual and knowing them will aid in comprehension. Most of these terms will be shown in *italics>* throughout the manual.

Machine Terms

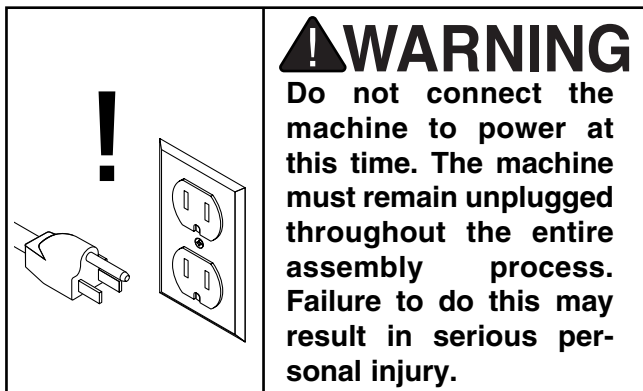
1. Fine Down Feed
2. Quill Lever (Coarse Down Feed)
3. Upper Belt Guard
4. Head Stock
5. Head Elevator
6. Column
7. Lower Belt Guard
8. Off Switch
9. On Switch
10. Reset Button

G4015Z Lathe/Mill

11. Feed Lever
12. Cross Feed Handle
13. Power Feed/Half Nut Lever
14. Lifting Peg
15. Lead Screw
16. Longitudinal Feed Handle
17. Tailstock Lock Handle
18. Tailstock Handle
19. Tailstock Barrel Lock
20. Compound Handle
21. Tool Post
22. Drill Chuck
23. 3 Jaw Chuck
24. Feed Rate Lever
25. Quill Lock Lever

SECTION 5: ASSEMBLY & SETUP

This section will cover the basics in assembly and setup. We recommend you complete assembly in the order in which it is presented to achieve the best results.



Handwheel

The handwheel for the apron must be installed.

1. Remove the acorn nut and washer from the cross feed *Lead Screw*.
2. Slide the handwheel onto the cross feed *Lead Screw*. Note the key way that is in the bore of the handwheel and orient it so it aligns with the key on the cross feed *Lead Screw*.
3. Secure the handwheel with the acorn nut and washer.
4. Secure the handle for the handwheel with a screw driver as in **Figure 4**.

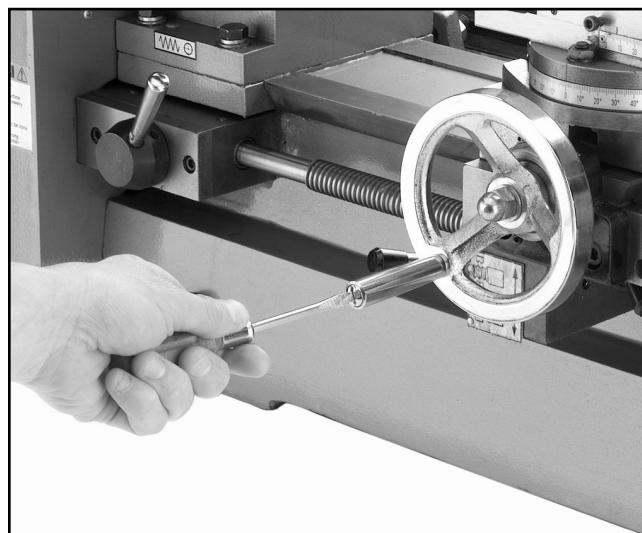


Figure 4. Secure the handle with a screw driver.



Hand Crank

The hand crank for the longitudinal manual feed must be installed.

1. The end of the *Lead Screw* has a small hole that is cross-drilled near its end. The hand crank has a similar hole drilled into the edge of the center ball. Orient these holes to each other and slide the hand crank onto the end of the shaft.
2. Rotate the hand crank on the shaft until the holes align.
3. Place the 4mm roll pin into the hole as in **Figure 5** and drive it in with a hammer.

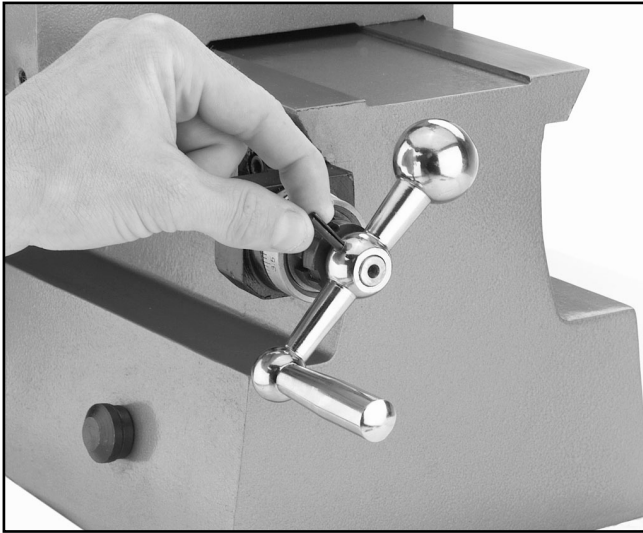


Figure 5. Place roll pin in hole and tap with hammer.



Lathe Chuck

The Model G4015Z Lathe/Mill comes equipped with a 4" 3-jaw chuck (already installed).

The 3-jaw chuck is a scroll-type chuck, meaning that all three jaws move in unison when adjustments are made. Most 4-jaw chucks, on the other hand, feature jaws which are adjusted independently. A 4-jaw chuck can be used to hold square or rectangular stock.

The 3 jaws, on a *3 Jaw Chuck*, open and close using the chuck key provided. Please refer to **Figure 6**. Rotating the key clockwise closes the jaws.

Grizzly offers 4-jaw chucks. Please note that a 5" adapter plate has been provided for mounting a 4-jaw chuck. Please see Grizzly's current catalog for ordering information on 4-jaw chucks.



Figure 6. Rotate chuck key to open/close jaws.

To use this mounting plate:

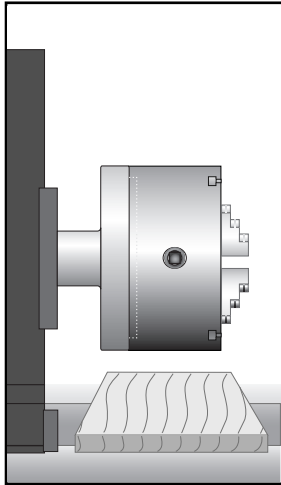
1. Fasten the plate to the 4-jaw chuck using the screws provided with the chuck.
2. Fasten the plate to the spindle plate using the 3 screws that were removed from the 3-jaw chuck.

DO NOT mount chucks measuring larger than 5" in diameter on this spindle.

Some 4-jaw chucks may not readily mount to the back plate provided. It may be necessary to drill new mounting holes and/or resurface and shoulder the plate so the chuck may be mounted accurately and safely. Should you have questions regarding this, please consult your local technical school, trained expert or other trade resources.



Lathe Chuck Removal



CAUTION

ALWAYS place a piece of plywood over the bed-ways of the lathe before removing or installing a lathe chuck. This helps by covering the sharp corners of the bed, protecting your hands and fingers from a pinch injury.

WARNING

Never leave a chuck key in the chuck when it is not in use. If the machine is accidentally started, the chuck key can become a projectile and cause serious personal injury.

To remove a chuck:

1. Place a piece of plywood across the lathe bed and position it just under the chuck. The board should be at least 8" wide and 10" long.
2. Locate the 3 socket head cap screws on the back of the back plate and remove 2 of them. **Please see Figure 7.**
3. Remove the last screw, while making sure to support the chuck with one hand. The chuck may come off as the last screw is removed so it is important that you are ready to support its weight.
4. Remove the chuck.

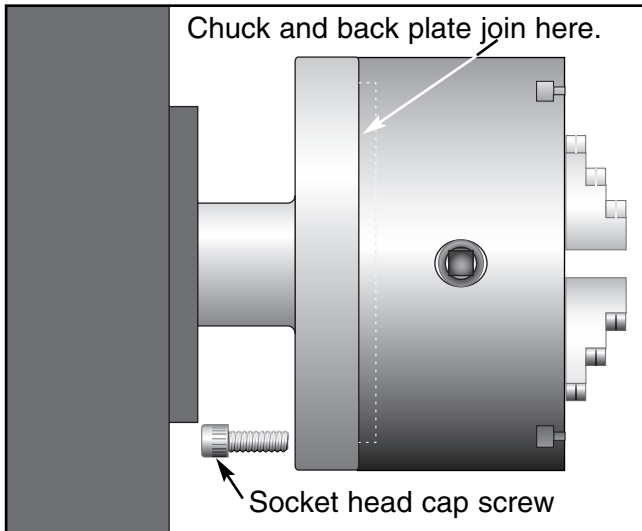


Figure 7. Remove screw from the back of chuck.

If the chuck is still tight on the spindle:

Tap the edge of the chuck with a rubber or wooden mallet while supporting the bottom of the chuck with your free hand. If the chuck does not immediately come off, rotate the spindle approximately 60° and tap again.

To install a chuck:

1. Place a piece of plywood across the lathe bed and position it just under the spindle.
2. Place a socket head screw into one of the holes in the back plate. Lift the chuck up to the spindle and align the threaded hole in the back of the chuck with the screw.
3. While supporting the weight of the chuck, turn the screw 3 turns. Do not tighten at this time.
4. Rotate the spindle and repeat **step 3** on the last two screws.
5. Return to the first screw and tighten it a little more. Tighten the other screws as well but only enough that the gap between the chuck and the back plate remains even.
6. Finally, tighten all three screws until the gap between the chuck and the back plate is closed.



Dead Center

The dead center is used to support stock which is too long to be supported by the chuck alone. Stock protruding more than $2\frac{1}{2}$ times its diameter should be supported by a dead or rolling center.

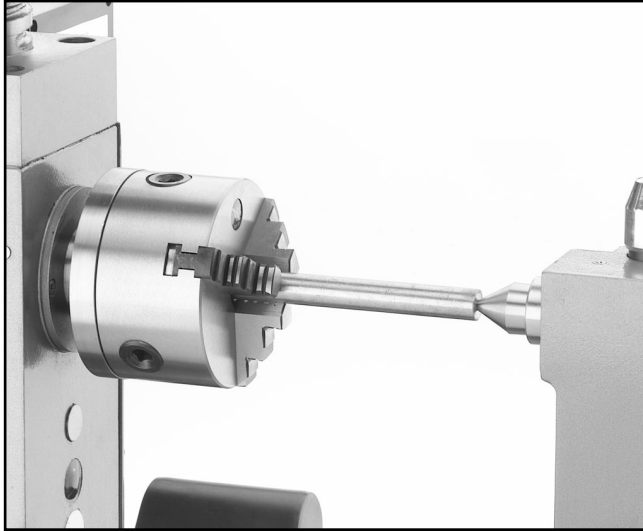


Figure 8. Dead center installed in tailstock.

The tailstock barrel and center have a Morse Taper #3. Before assembling these, insure that the mating surfaces are “white glove” clean. Clean the mating surfaces so they are free of dirt and oil. These parts will last longer and remain accurate when properly cleaned before assembly. Morse tapers will not interlock when dirt or oil are present on the mounting surfaces.

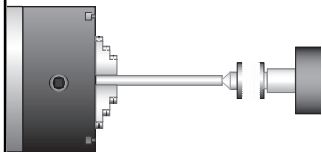
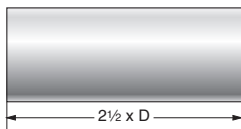
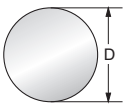
Insert the end of the center into the tailstock bore until it seats. The force of the center contacting a mounted workpiece will fully seat the taper when the handwheel is tightened.

When using a center, the tailstock barrel should protrude about $\frac{1}{2}$ " and not more than $\frac{1}{4}$ " out of the tailstock body. **See Figure 8.**

To remove the live center, back the tailstock barrel all the way into the tailstock casting by turning the handwheel, on the end of the tailstock, counterclockwise. The live center will pop out. Be sure to hold it before it comes out lest it drop on the lathe bed and damage the tip.



CAUTION



Always use a center to support the end of any workpiece that protrudes out of the chuck further than $2\frac{1}{2}$ times its own diameter. A workpiece not supported this way could bend suddenly and cause serious personal injury.

Tool Post

The Model G4015Z comes supplied with a 4 way turret tool post. It is designed to accept up to 4- $\frac{1}{2}$ " tool bits. Other devices and holders may be installed into the tool post and arranged as in **Figure 9**. When more than one tool is secured into the tool post, changing from one tool to another is quickly done by loosening the lock lever (#5) and rotating the post to the desired tool. A spring-loaded catch is installed below the tool post. This allows motion in only the counter-clockwise direction. The catch causes the tool post to stop at the same rotational point for each tool placement. This feature can be useful for some types of machining setups. Please note that the secureness of the tool post is not dependent upon the catch. Thus, the tool post can be positioned at any rotational location and properly secured with the lock lever.

If using tool bits that require shimming, be sure to use steel shims as opposed to aluminum or brass shims. Soft shims may give, allowing the tool bit to become loose!

When securing a tool bit into the tool post, always remember these rules:

- Secure the tool bit with at least 2 bolts on the tool post.
- Make sure the top of the tool bit is at the lathe spindle center line or just below. The tailstock center can be used as in **Figure 10**.
- Never extend the tool bit more than $2\frac{1}{2}$ times its thickness from the edge of the tool rest. i.e. a $\frac{3}{8}$ " tool bit should only extend $\frac{15}{16}$ " past the bottom of the tool rest. Less is best!
- Always use sharp tool bits.

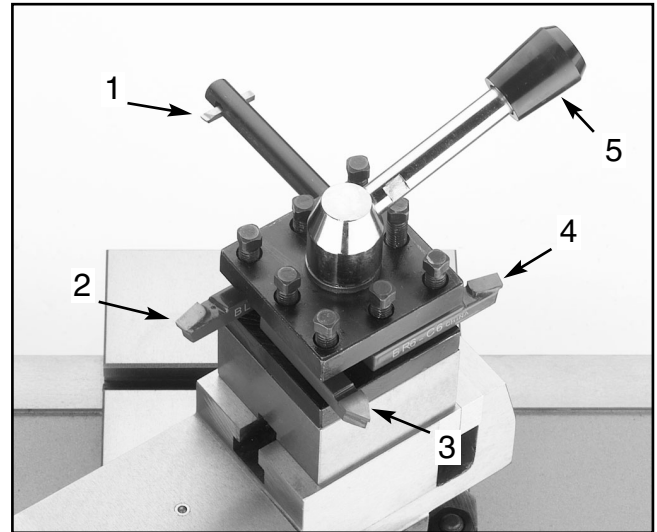


Figure 9. Four tools mounted into the tool post:

1. Boring Bar
2. Left-Cutting Tool Bit
3. Threading Tool Bit
4. Right-Cutting Tool Bit
5. Lock Lever

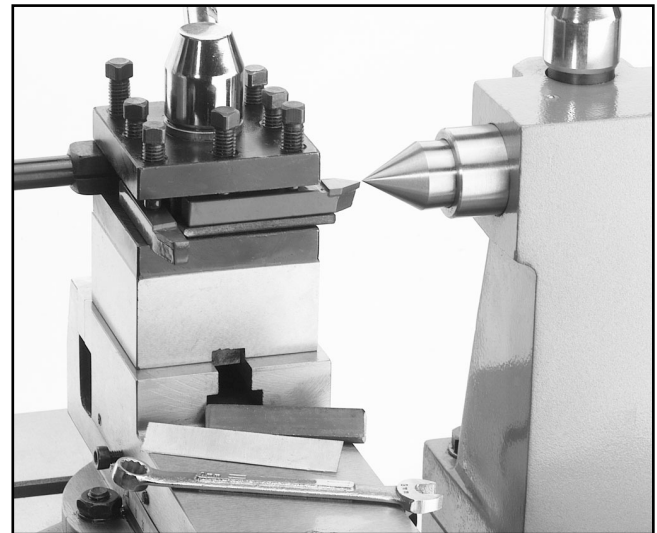


Figure 10. Using a center to check tool bit height.

Drill Chuck

The Model G4015Z comes supplied with a drill chuck and arbor that can be used in the tailstock on the lathe or in the spindle for the drill press. The arbor and drill chuck are assembled and installed into the spindle for the drill press spindle at the factory.



Drill Chuck Removal

To remove the drill chuck from the drill press:

1. **Unplug the machine.**
2. Return the spindle to the highest position.
3. Remove the small plastic cap on top of the belt guard.
4. Grasp the drill chuck with one hand and unscrew the draw bar 3 turns with the other.
5. Secure the quill with the quill lock.
6. Tap on the end of the draw bar with a soft faced mallet as in **Figure 11**. Do Not use a steel hammer! Damage to the draw bar, such as chipping, may occur.
7. Once the arbor has become loose, hold the drill chuck with one hand while unthreading the remainder of the draw bolt.



Figure 11. Removing drill chuck.



Drill Press Mounting

To mount the drill chuck into the drill press:

1. Remove the small plastic cap on top of the belt guard and slide the draw bar out of the spindle through the top.
2. Insert the arbor half way into the drill press spindle, then quickly slide it in place.
3. Replace the draw bar and thread it into the arbor. **Do Not** over tighten! The draw bar only needs to be lightly tightened. Tightening any further will make it difficult to remove the arbor!



Lathe Mounting

Prior to mounting the drill chuck into the tailstock wipe the inside of the tailstock barrel and arbor down with a clean cloth and inspect them for nicks or scratches. Any irregularities on the surface of the arbor or inside the tailstock barrel will hinder the locking capability of the taper and should be dressed smooth with a fine file.

To mount the drill chuck into the tailstock of the lathe, slide the arbor into the tailstock barrel about one half of the way. With a quick motion, finish sliding the chuck the rest of the way. This should seat it well into the tailstock barrel.

Because the drill chuck arbor is threaded on the small end, removal requires the use of a mallet and a wooden dowel as in **Figure 12**. Tap along the back edge of the drill chuck on the left and then the right. The drill chuck and arbor will pop loose from the tailstock barrel.

Drill chuck arbors with a standard tang (or flat) on the small end allow the operator to simply turn the tailstock handwheel counterclockwise until the drill chuck and arbor pop loose. Grizzly offers a variety of chucks and arbors. Please see our current catalog for more information.

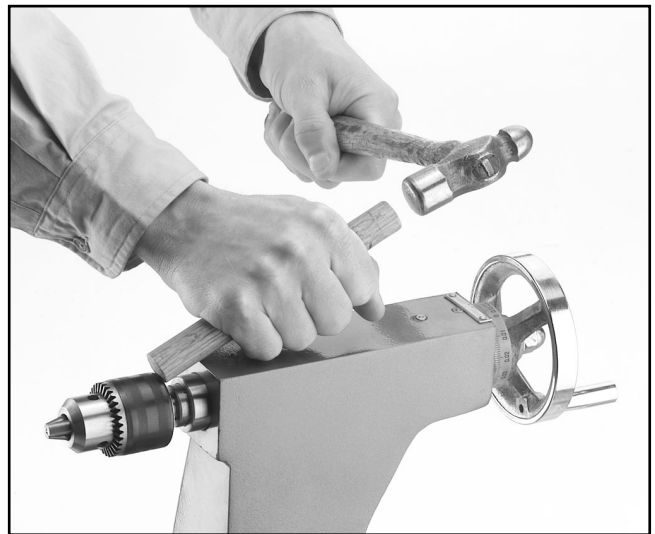


Figure 12. Seating the arbor and drill chuck.



Machine Vise

The Model G4015Z comes supplied with a milling vise which also serves as the compound for the lathe. The 4-way tool post must be removed before using the vise. Loosen the lock handle and slide the tool post off of the compound/vise as in **Figure 13**.

The milling vise can be aligned to 1 of the 2 axes of the lathe or at any angle desired. Care must be given to setting the vise if a precision angle is needed. The following instructions are given to make the jaws parallel to the travel of the cross slide.

1. Remove the tool post as described above.
2. Loosen the swivel bolts on the compound/vise so it can swivel freely. Pivot the compound/vise so the jaws of the vise are roughly aligned with the cross slide.
3. Mount the drill chuck into the milling spindle and secure an indicator into it or, place a dial indicator mounted to a magnetic base on the bed as in **Figure 14**.
4. Position the cross slide and apron so the indicator point contacts the stationary vise jaw or a parallel mounted into the vise.
5. Move the cross slide with the hand wheel and watch the dial. Note the direction the needle is moving on the dial and by how much.
6. When the vise has moved so the indicator is at the other end of the parallel, pivot the vise one half the amount of motion detected in **step 6**.
7. Move the vise to the starting position and note the difference. Again, pivot the vise one half the difference.
8. Repeat **steps 6** through **8** until the dial remains stationary when the vise is moved.
9. Tighten the pivot bolts on the base of the compound/vise.

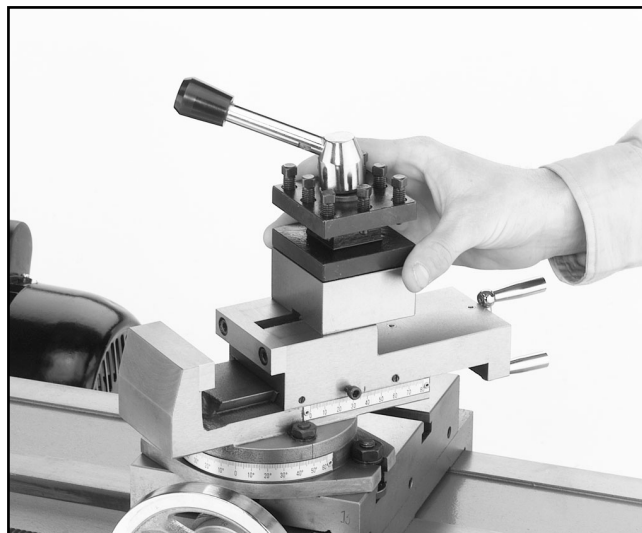


Figure 13. Sliding the tool post off.

	<p>CAUTION</p> <p>Never use a vise for milling unless it is rated for milling machines. Drill press or bench vises are not designed for the rigors of machining. Vise failure during a milling operation may lead to serious personal injury.</p>
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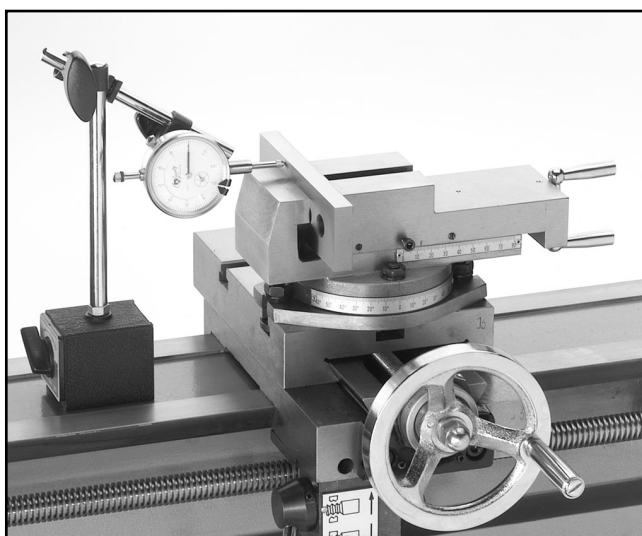


Figure 14. Aligning vise for precision.



SECTION 6: LATHE CONTROLS

Lathe Speeds

Before using the lathe, the hub on the end of the lathe spindle must be pulled out as shown in **Figure 15**. To ease engagement of this hub, slowly rotate the lathe spindle by hand while gently pulling the hub.

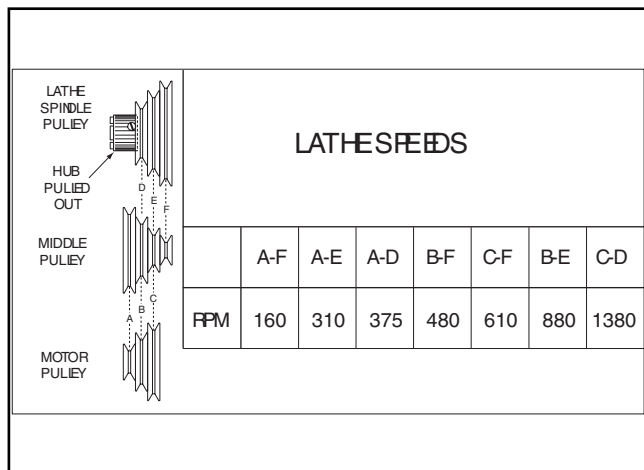


Figure 15. Speed chart.

The speed of the lathe is controlled by the positions of the belts on the pulleys. The chart in **Figure 15** shows the various combinations of belt positions for achieving a range of 6 speeds.

Example:

To select a spindle speed of 310 R.P.M., place a belt on the 3rd sheave (from the outer-most sheave) of the middle pulley and the 2nd sheave of the spindle pulley. Place a belt from the first sheave on the motor pulley to the first sheave of the middle pulley.

To change belt position:

1. **Unplug the machine.**
2. Loosen the tensioning nut located just above the motor. **See Figure 16.**
3. Loosen the nut on shaft for the middle pulley. **See Figure 17.**
4. Lift the motor and remove the lower belt from G4015Z Lathe/Mill

the motor pulley.

5. Place the upper belt in the desired position.
6. Place the bottom belt in the desired pulleys.
7. Pull tension on the upper belt with the middle pulley and tighten the nut loosened in **step 3**.
8. Tighten the tensioning nut just above the motor until there is $\frac{1}{4}$ " deflection with moderate pressure. *Do not over tighten.*



Figure 16. Tension nut shown.



Figure 17. Loosen this nut to adjust pulley.



Feed Selection

Never move the feed rate lever while machine is running.

The Model G4015Z Lathe/Mill has 2 feed control levers which must be engaged in order to use the powerfeed or threading feature. The *Feed Rate Lever*, shown in **Figure 18**, controls internal gears that change the feed rate by a factor of 2. Turning the lever to position “I” will cause the *Lead Screw* to turn at twice the rate as when it is in position “II”. When this lever is straight up, the gearing is in neutral and no power feed is available.

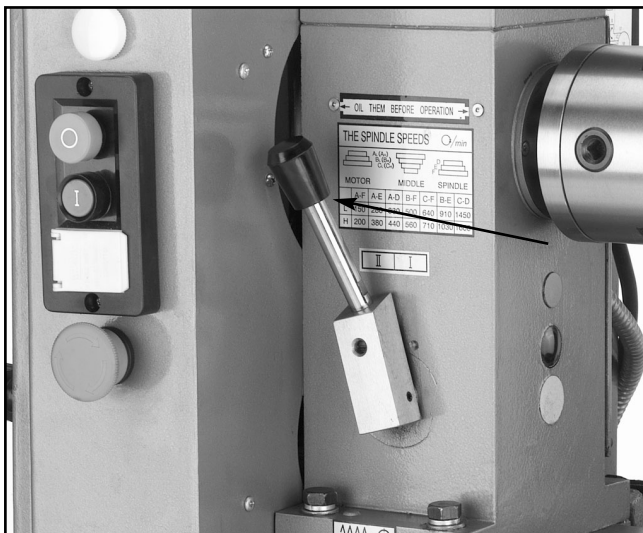


Figure 18. Feed rate selection lever.

Important:

Do not force any lever on the machine. If the lever will not engage, rotate the chuck *by hand* while keeping light pressure on the selector. As the chuck rotates it aligns the gear teeth inside the selector box and the selector will engage.



Feed Lever

While the *Lead Screw* can be placed in neutral with the feed selection lever, another lever allows the power feeding feature of the lathe to be turned on and off. When turned to the left, as in **Figure 18**, the *Feed Lever* connects power to the *Lead Screw*, providing power to the apron. When turned to the right, the apron can be fed manually and the hand crank no longer turns by itself. The apron cannot be moved manually unless the *Feed Rate Lever* is in neutral or the *Feed Lever* is turned to the right. Please see the caution below.

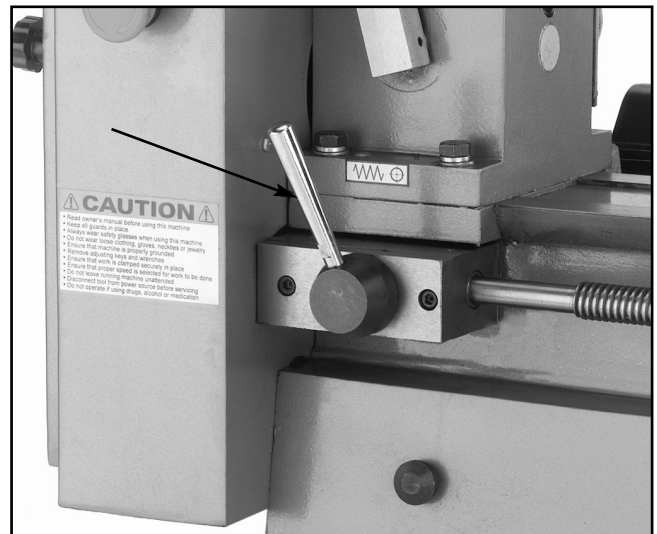
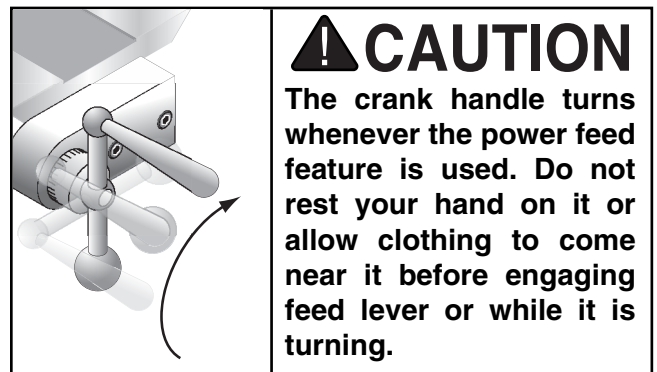


Figure 18. Feed Lever indicated by arrow.



Half Nut

The half nut lever is located under the left hand side apron as shown in **Figure 19**. This handle may be engaged and disengaged while the machine is running and while making a cut. Move the lever to the down position and the half nut is engaged. Because the threads of the nut and *Lead Screw* will not always be aligned, engaging the half nut may require waiting until they are. Do not force the handle. Apply light pressure to the handle and when the threads are aligned the handle will engage.

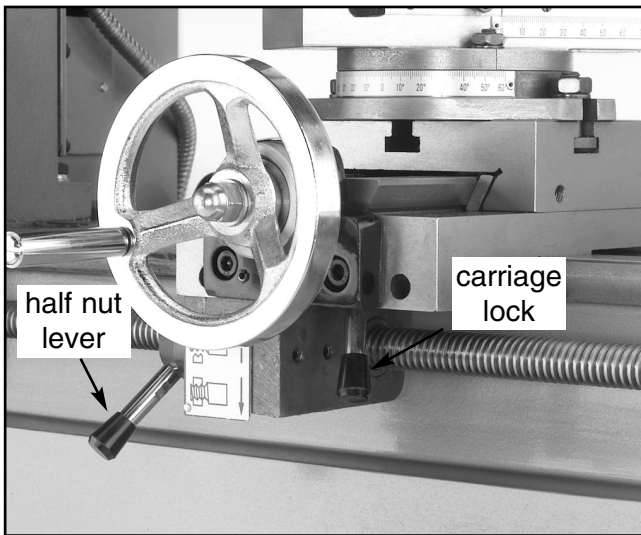


Figure 19. The half nut lever and carriage lock.

Carriage Lock

The carriage lock lever is located under the right hand side of the apron as shown in **Figure 18**. This allows the carriage to be locked in place for precision facing operations while using the lathe or to make a set up in a milling operation more rigid, among other things.

Carriage Controls

The lathe has 3 handles for manual control of the tool bit during machining operations. One full turn on the cross slide or longitudinal hand cranks will produce 0.100" (one tenth of an inch) of motion. The cross slide and apron hand crank have dials with divisions showing relative motion. The compound has a direct reading scale on its side which is calibrated in 1 millimeter increments. The following is a description of each slide and their measuring characteristics.

Compound Slide - This slide is adjustable to any angle. By loosening the bolts at the swivel base as shown in **Figure 20**, the compound may pivot to any angle relative to the turning axis of the lathe spindle. This feature allows tapered cuts to be produced on a workpiece, and when set to 60°, is helpful in cutting threads, etc. The scale on the side of the slide has divisions in millimeters and is 80 millimeters long. Each line marks 1 millimeter (or about 0.03937"). The tool post is mounted to the top of the compound slide and when removed allows the slide to be used as a vise.



Figure 20. Changing the angle on compound.

Cross Slide - This hand wheel moves the compound slide across the lathe bed. Turning the dial clockwise moves the slide away from the operator. The motion of this slide is used for facing a workpiece and when advancing a cut for reducing a diameter. The dial has 100 divisions with each division representing 0.001" (one thousandths of an inch) of motion for the slide. The label above the dial reports that each line represents 0.002". It is best to think of this as the amount of reduction in diameter on the part per line on the dial. Therefore, rotating the dial 10 marks will move the slide 0.010" and multiplying this amount by 0.002" equals 0.020". Therefore, the diameter of the part will be reduced by 0.020".

Apron - The longitudinal motion of the apron is controlled by the hand crank at the end of the lathe bed. **See Figure 21**. The motion of this slide is used when cutting along the length of a workpiece. This slide can also be operated with the power feed feature.

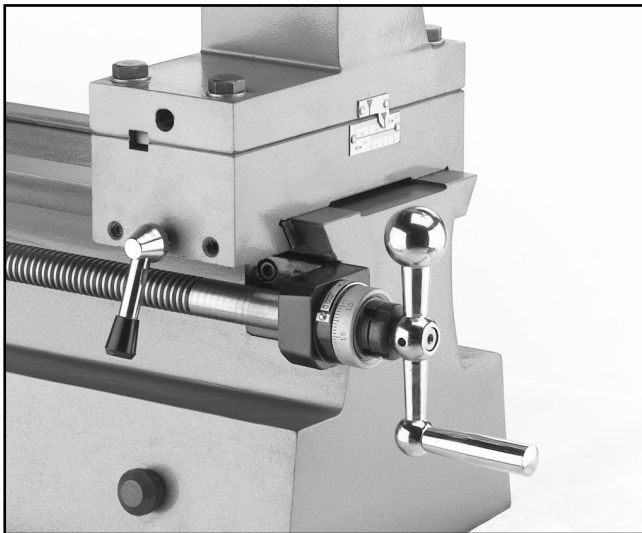


Figure 21. Hand crank for the apron.

Graduated Dials - Each dial can be rotated without turning the hand crank. This is helpful because the dial can be set to zero after the tool bit touches the part and the location of the slide and tool bit will be known. The graduated dial can be adjusted by holding the hand crank with one hand and turning the dial with the other.



Tailstock Controls

The tailstock comes supplied with a handwheel with graduated dial, barrel lock, tailstock lock and offset feature. **Figure 22** shows the locations of each.

Tailstock Handwheel - Turning the handwheel advances or retracts the barrel in the tailstock. The graduated dial on the handwheel is adjustable.

Barrel Lock Lever - This lever locks the tailstock barrel in place.

Tailstock Lock Lever - This lever locks the tailstock in place on the lathe bed.

Offset Mechanism - Loosening these bolts allows the tailstock to be offset from center by turning a screw. This feature will allow taper turning when a workpiece is held between centers.

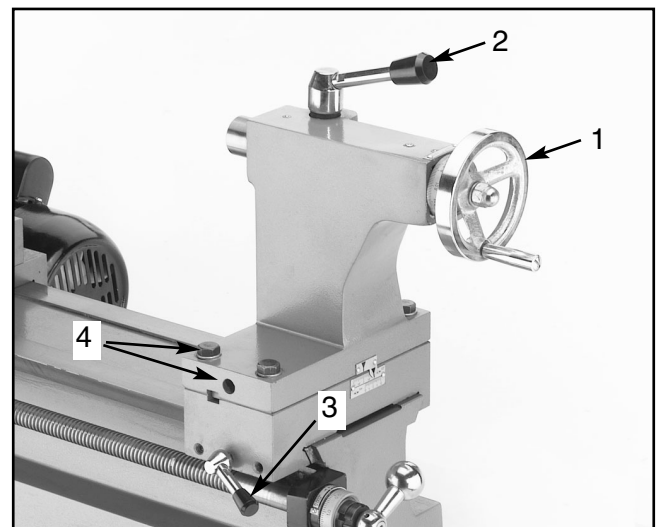


Figure 22. Detail of tailstock controls.

1. Tailstock Handwheel
2. Barrel Lock Lever
3. Tailstock Lock Lever
4. Offset Mechanism

SECTION 7: DRILL PRESS CONTROLS

Drill Press Speeds

The speed of the drill press spindle is controlled by 2 groups of belts and pulleys. The belt positions on the end of the lathe control one speed range. See **Figure 23**. The belts and pulleys above the drill press control the other range. See **Figure 24**.

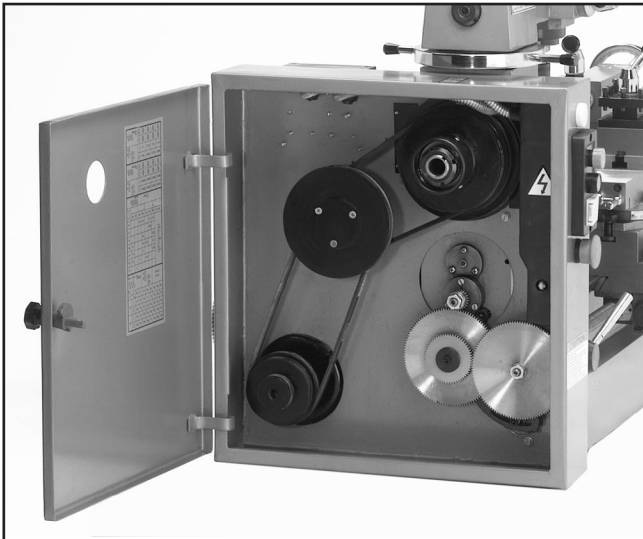


Figure 23. Lower pulleys for speed changes.

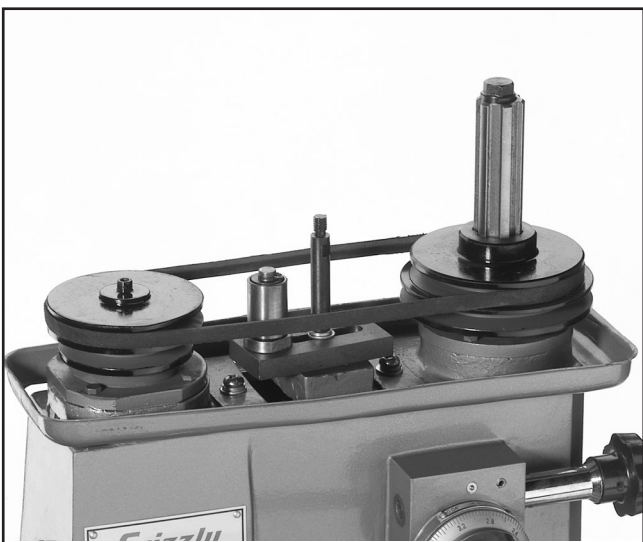


Figure 24. Upper pulleys for speed changes.

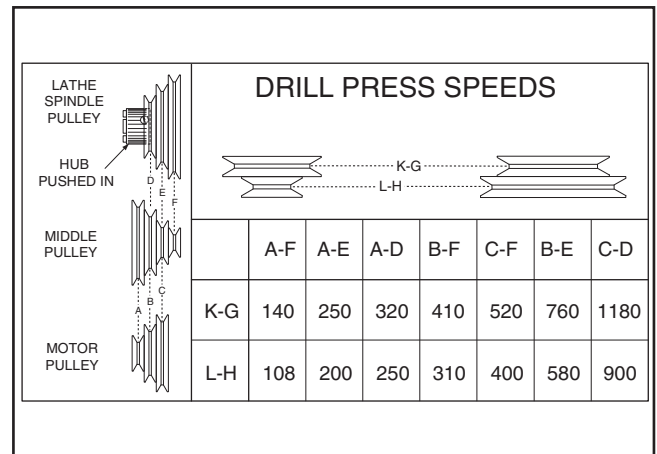
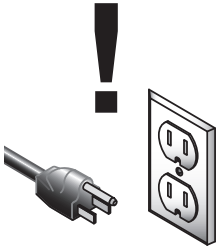


Figure 25. Speed chart.



! WARNING

Disconnect the power before changing speeds or making adjustments to this machine. Failure to do this may result in serious personal injury.

Unplug the Lathe/Mill! Before using the drill press, the hub at the end of the lathe spindle must be adjusted to the “in” position. See **Figure 25**. To ease engagement of this hub, slowly rotate the drill spindle by hand while applying pressure to the hub.

The chart also shows the various combinations of belt positions for achieving a desired speed.

Example:

To select a spindle speed of 310 R.P.M., start by moving the belts at the end of the lathe. Move the lower belt to the “B” position. Move the upper belt to the “F” position. Follow the belt changing procedures in the section titled **Lathe Speeds**. Next, move the belt located above the drill press to the “L-H” position.

To change belt position:

1. Unplug the machine.
2. Remove the *Upper Belt Guard*, loosen the cover securing stud and pivot the belt tensioner to relax tension on the belt. See **Figure 26**.
3. While slowly turning a pulley, roll the belt up or down to the desired sheave. It is always easier to roll off of the larger pulley onto a smaller pulley. **Do not allow fingers to become trapped between belt and pulley.**
4. Pivot the belt tensioner until the belt is tight and secure the tensioner by tightening the stud.
5. Replace belt guard.



Figure 26. Loosen stud to pivot belt tensioner.



Quill Lock Lever

The height of the spindle can be locked with the *Quill Lock Lever*. Set the desired height with the *Quill Lever* and turn the lever down. The lever can be clearly seen on the bottom right hand corner of **Figure 27**.

Fine Down Feed

The up and down motion of the drill press spindle is controlled just like any other drill press with a *Quill Lever*. But unlike most drill presses, the Model G4015Z is supplied with a *Fine Down Feed* knob, indicated by the arrow in **Figure 27**.

To activate this feature, rotate the *Quill Lever* while depressing the black knob in the middle of the center of the hub as in **Figure 27**. The knob will engage and the spindle will no longer move using the *Quill Lever*. Rotating the *Fine Down Feed* knob in a clockwise direction will cause the spindle to go down. To disengage this feature, rotate the *Fine Down Feed* knob and pull on the knob in the center of the hub. Rotating the hand-wheel will always aid in engaging and disengaging this feature.



Figure 27. Move the handle while depressing knob.



SECTION 8: ADJUSTMENTS

Gibs

There are three gib adjustments for the Model G4015Z. They are: the cross-slide gib, the compound slide gib and the apron gib.

Cross-slide Gib - The gib on the cross-slide is adjusted by tightening or loosening the 4 setscrews located on the right hand side of the slide. **See Figure 28.** The large setscrew in the middle is used to lock the cross slide in place during machining operations. Before adjusting the gib screws, loosen this setscrew.

The gib is held in place by the setscrews. *Do not over tighten.* The gib is properly adjusted when a slight drag is detected while turning the hand crank. This drag should be evenly distributed among the 4 setscrews, so adjust each so a slight drag is detected while the hand crank is turned. The large setscrew in the middle of the slide can be tightened to lock the slide in place.

NOTICE

When adjusting gibs, keep in mind that the goal of gib adjustment is to remove unnecessary sloppiness from the slides movement without causing them to bind. Loose gibs may cause poor finishes on the workpiece and undue wear on the slide. Over tightening may cause premature wear on the slide, *Lead Screw* and nut.

Compound Gib - The gib on the compound has 2 setscrews to maintain tension on the slide. These setscrews are held in place with retaining nuts. To adjust, loosen the retaining nuts and then tighten the setscrews as needed. When proper tension has been detected by turning the hand crank on the compound, tighten the retaining nuts while maintaining the position of the setscrew with an Allen® wrench as in **Figure 29.**

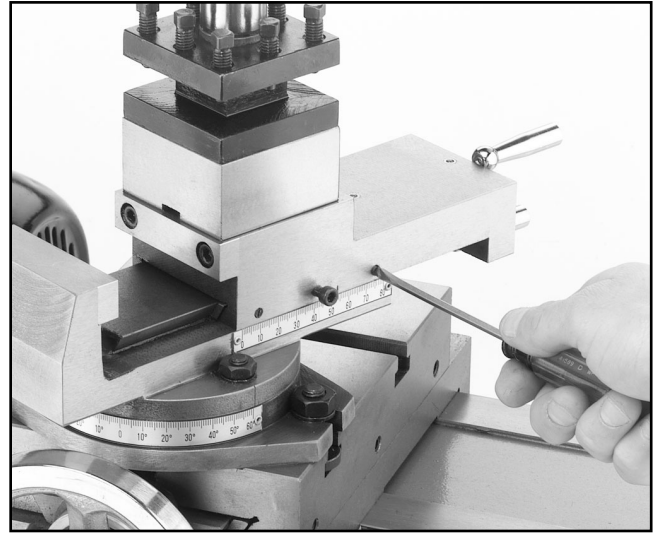


Figure 28. Tightening this screw tightens gib.

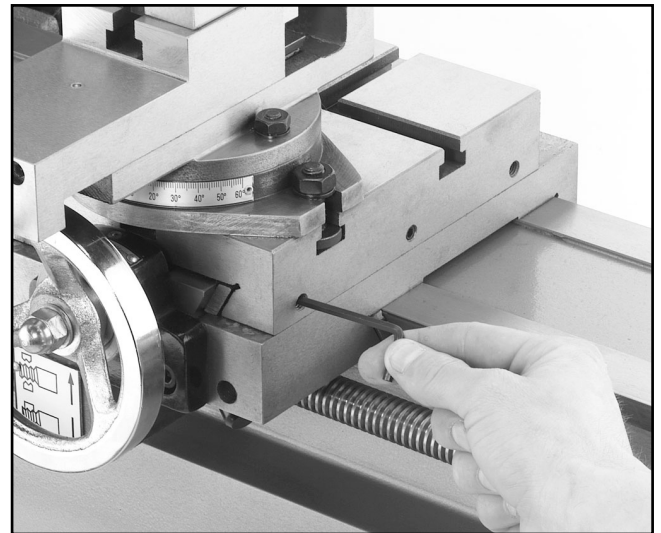


Figure 29. Securing setscrew.

Apron Gib - There are 2 setscrews that tension the saddle gib. Before making adjustments to the saddle gib, ensure that the front lock lever is loose by turning it counterclockwise. **See Figure 30.**

It is important the setscrews are tightened evenly. A slight drag should be detected while turning the hand crank at the end of the lathe.

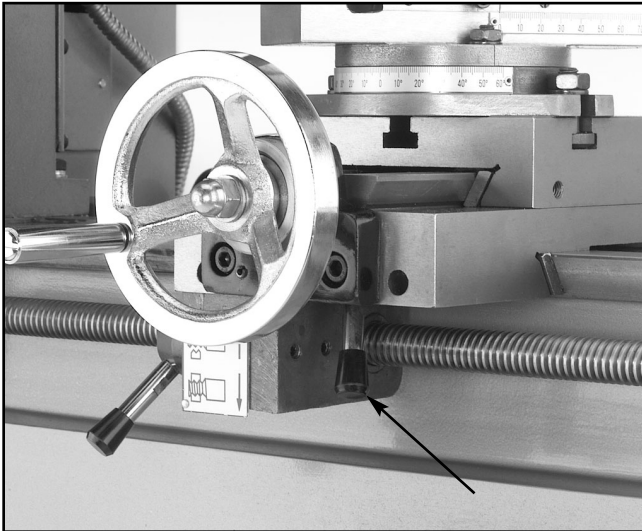


Figure 30. This bolt locks the apron in place.



Head Stock

The *Head Stock* can be adjusted up or down to suit height requirements for different workpieces. **Figure 31** shows the locking setscrew and lifting mechanism. To adjust the height, loosen the locking setscrew and rotate the lifting levers. When the *Head Stock* is at the desired height, lock in place with the lever. The *Head Stock* can be rotated around the *column* allowing it to be positioned out of the way during lathe operations.

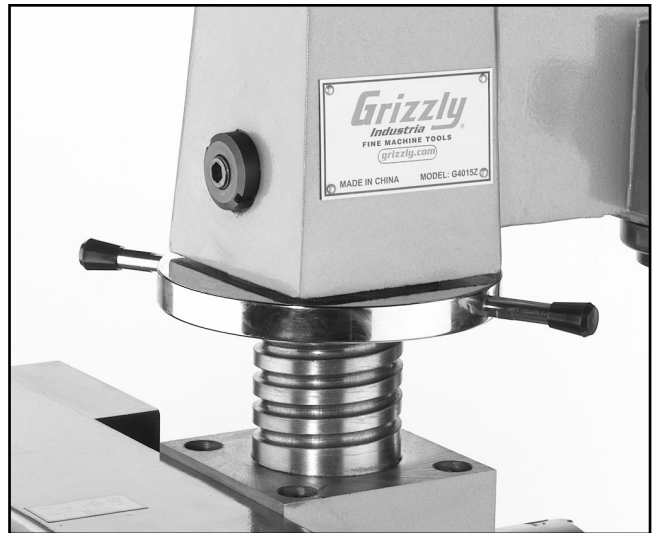


Figure 31. Elevating the *Head Stock*.



Tailstock

The tailstock on the Model G4015Z is aligned with the headstock at the factory. However, we recommended that you take the time to ensure that the tailstock is aligned to your own desired tolerances. To align the tailstock:

1. Center drill a 6" long piece of round cold rolled stock on both ends. Set it aside for use in **step 4**.
2. Make a dead center by turning a shoulder to make a shank. Flip the piece over in the chuck and turn a 60° point. **See Figure 32**. As long as it remains in the chuck, the point of your center will be accurate to your spindle axis. Keep in mind that the point will have to be refinished whenever it is removed and returned to the chuck.

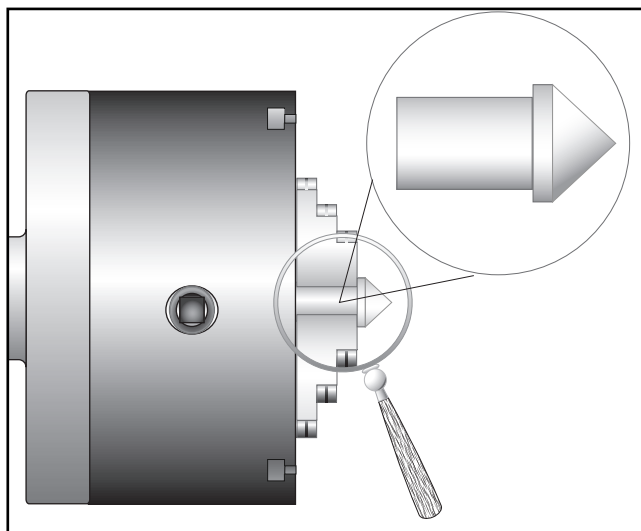


Figure 32. Finished dead center.

3. Place a center in your tailstock.
4. Attach a lathe dog to the bar stock and mount it between the centers. **See Figure 33**.
5. Turn approximately .010" off of the diameter.

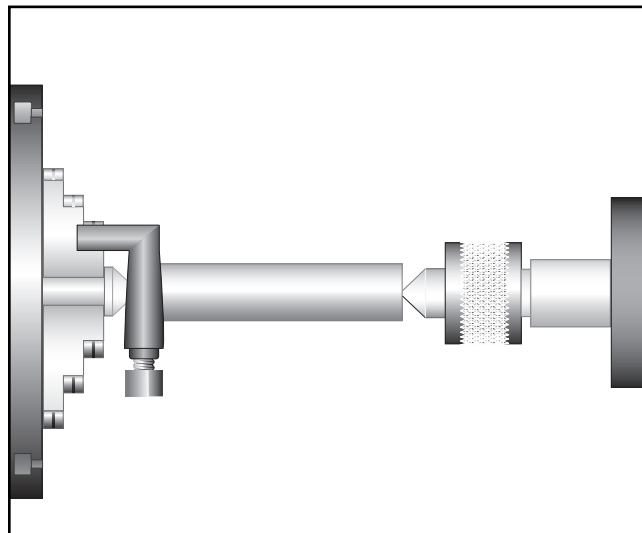


Figure 33. Bar stock mounted on centers.

NOTICE

Before making adjustments to the tailstock, mount a dial indicator so that the dial plunger is on the tailstock barrel. **See Figure 34.**

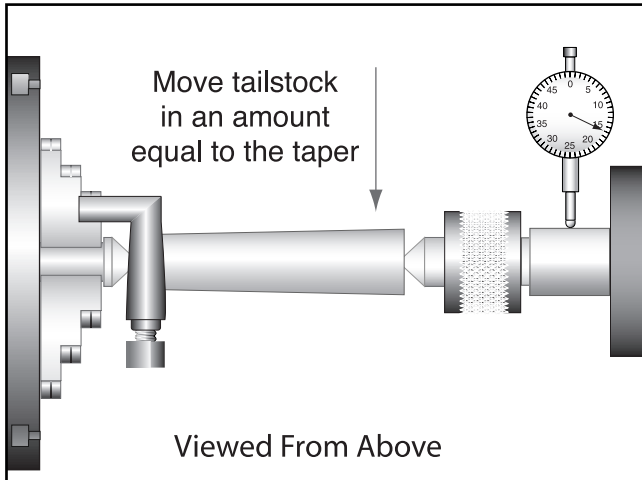


Figure 34. Adjusting for headstock end taper.

6. Measure the workpiece with a micrometer. If the stock is fat at the tailstock end, the tailstock needs to be moved toward you the amount of the taper. **See Figure 34.** If the stock is thinner at the tailstock end, the tailstock needs to be moved away from the operator by at least the amount of the taper. **See Figure 35.**

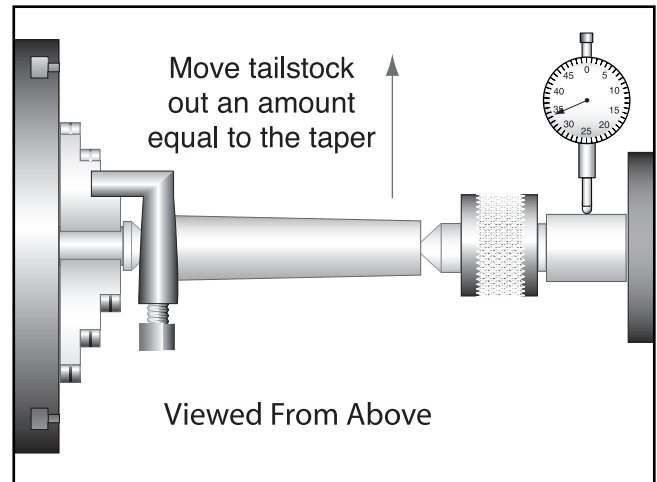


Figure 35. Adjusting for tailstock end taper.

7. Loosen the 4 tailstock mounting bolts. Adjust the tailstock offset by the amount of the taper by turning the adjustment setscrews. **See Figure 36.** Turn another .010" off of the stock and check for taper. Repeat as necessary until the desired amount of accuracy is achieved.

NOTICE

DO NOT forget to lock down the tailstock after each adjustment.



Figure 36. Tailstock offset adjustment screw.



SECTION 9: OPERATIONS

Control Panel

It is vital that you become familiar with the control panel before operating the Model G4015Z.

Power to the motor is controlled through a series of switches mounted on the *Lower Belt Guard*. **Figure 37** shows the various buttons and light. Please examine the layout and note the list of functions to the right before running the lathe/mill.

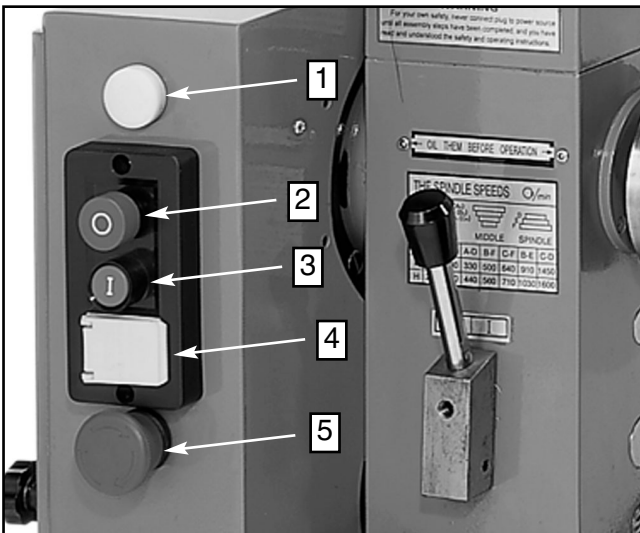
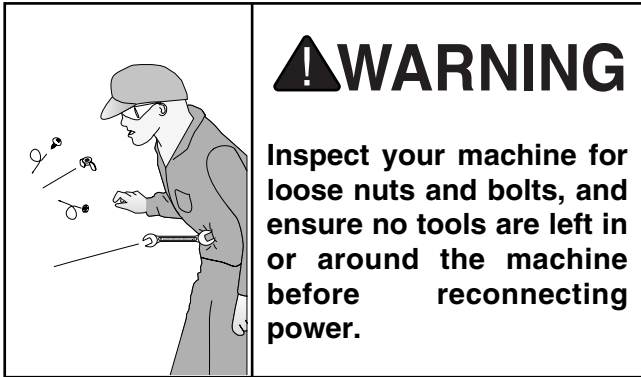


Figure 37. Control panel components.

1. Power indicator light – shines when power is turned on using the system reset switch.
2. Motor off button – turns motor off.
3. Motor on button – turns motor on.
4. Reversing switch – selects direction of rotation for spindles. Lift the cover to access the switch. Pushing the button on the left hand side allows the motor to operate in the forward direction. Push the button on the right hand side and the motor reverses.
5. System reset – disconnects power from system. Rotate the button and allow to pop out. In the event of an emergency, the button can be depressed and all power to the motor will be turned off.



Test Run



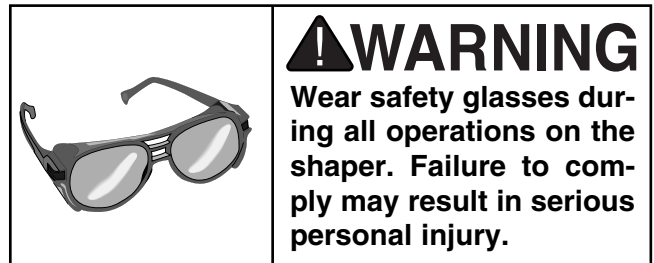
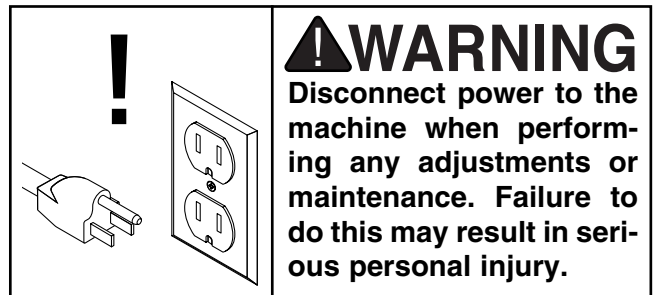
Now that the lathe is securely in place and you've read the safety guidelines, it's time to give the machine a test run.

Before starting the machine:

1. Make sure the machine is properly grounded, the power switch is in the "OFF" position and the reversing switch is selected for forward.
2. Inspect the machine to ensure that all hand tools are out of the way, guards are in place and nothing is impeding the movement of the chuck. Check this by rotating the chuck by hand.
3. Rotate the System *Reset Button* and allow it to pop out. Push the start button on the control panel while keeping a finger poised over the stop button. The machine should run smoothly with little or no vibration or rubbing noises when it starts. Strange or unnatural noises should be investigated and corrected before operating the machine further.

If the direction is reversed, contact our service department for further instructions.

4. If the lathe/mill is running correctly, push the stop button, wait for the machine to come to a complete stop and take some time to review the various controls.



Reading the Charts

Charts for the powerfeed and thread cutting features are located on the inside of the *Lower Belt Guard*. **Figure 38** shows a segment of the chart and a brief description.

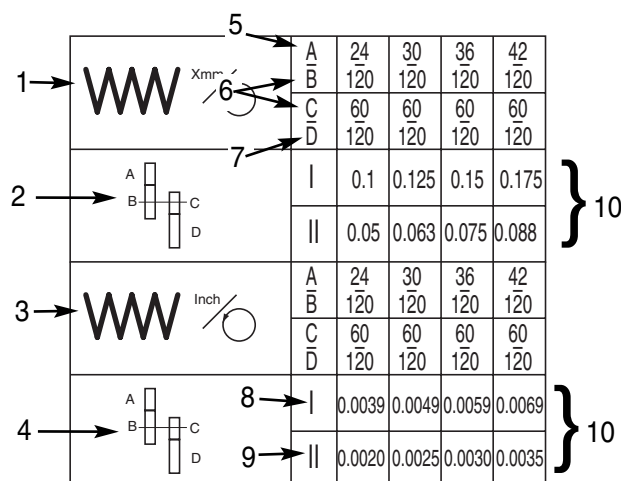


Figure 38. Rates given in millimeters and inches.

Please note that these charts reflect approximate apron movement per revolution.

1. Millimeters per revolution.
2. Gear layout for millimeters per revolution.
3. Inches per revolution.
4. Gear layout for inches per revolution.
5. Gear position A (all numbers in the row to the right represent number of teeth on gears used here).
6. Gear position B and C: combination gears listed as 125/127 or 120/60.
7. Gear position D (all numbers in the row to the right represent number of teeth on gears used here).
8. Feed rate selected for I.
9. Feed rate selected for II.
10. Approximate feed rates in inches or millimeters.

Feed Rates

Gearing for feed rates are detailed in **Figure 38**. In the example below we will be selecting gears for a feed rate of 0.002" per revolution:

1. Find 0.002" in the chart.
2. Locate the number in row A, which is above 0.002". The number is 24, representing a gear with 24 teeth.
3. The number in row B above 0.002" is 120 and the number in row C is 60. These 2 numbers represent one of the 2 combination gears supplied with your lathe.
4. Finally, in row D you will find the number 120 which represents a gear with 120 teeth.
5. Looking at the Gear Layout we see that gear A (24 teeth) meshes with gear B (120 teeth) and that gear C (60 teeth) meshes with gear D (120 teeth).
5. Move the *Feed Rate Lever* to the I position as described in the section titled **Feed Selection**.

Please note that the corresponding feed rate in millimeters would be 0.1 millimeters per revolution and that the gearing is identical.

Changing Gears

Changing gears on the Model G4015Z is straight forward. Refer to the label found inside of the *Lower Belt Guard* for proper gear selection while following the example below. We will be changing the gears to those that would be used to set the machine for a 0.002" per revolution feed rate. These instructions assume that all of the gears need to be changed. The number of teeth are stamped on each gear. To begin:

1. **Unplug the machine.**
2. Remove the nuts on the end of the shafts for gears A and D.
3. Loosen the cap screw at the bottom of the gear support arm and allow the arm to rotate downward as in **Figure 39**.
4. Remove the cap screw in the middle of the combination gear B/C. This will allow removal of the gears and bushing supporting them. A tee-nut will remain in the gear support arm as in **Figure 40**.
5. Remove gears A and D.

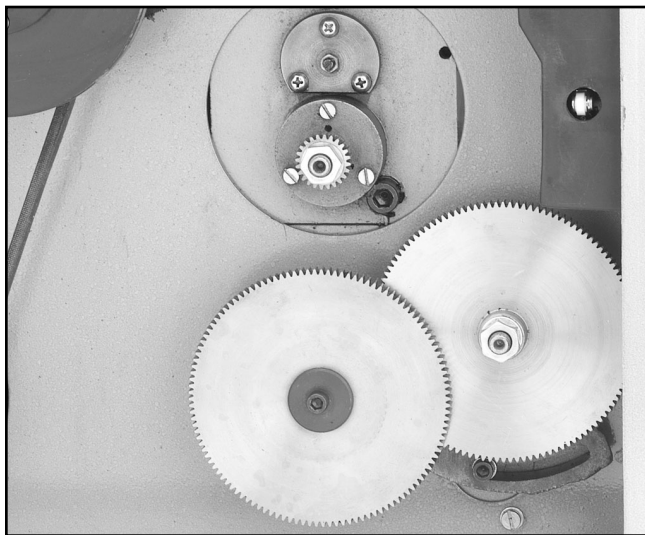


Figure 39. Swing gears in lower position.

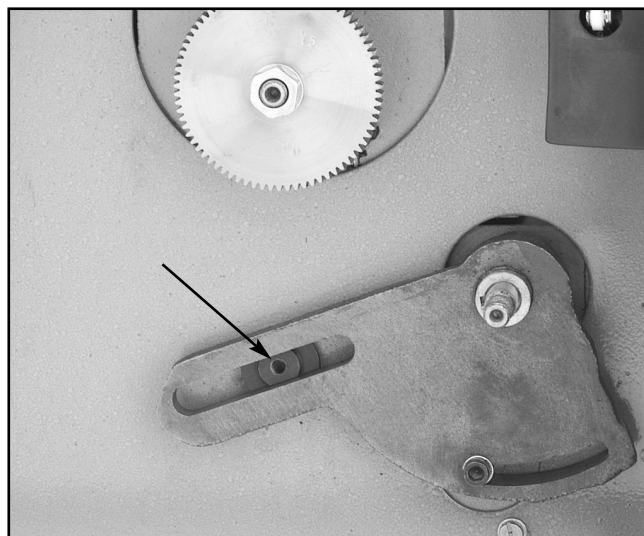


Figure 40. Gear support arm with tee-nut.

6. Replace the gears in positions A and D with 24 and 120 tooth gears, respectively.
7. Insert the bushing into the 60/100 tooth combination gear from the side that has 60 teeth. Align the flats of the bushing to the slot in the

NOTICE

Make sure the gears mesh properly before operating the machine. The gears are properly meshed when the teeth between 2 gears are fully engaged. Damage to the gears will occur if adjustments are not correct.

gear support arm and loosely fasten the assembly to the tee-nut using the cap screw. **Figure 41** shows the proper sequence. Slide the combination gear along the slot in the support arm until gear C meshes with gear D, as in **Figure 42**, and tighten the cap screw.

8. Rotate the support arm until gears B and A are in mesh. Tighten the cap screw at the bottom of the gear support arm. **Figure 43** shows the gears properly aligned and in mesh.

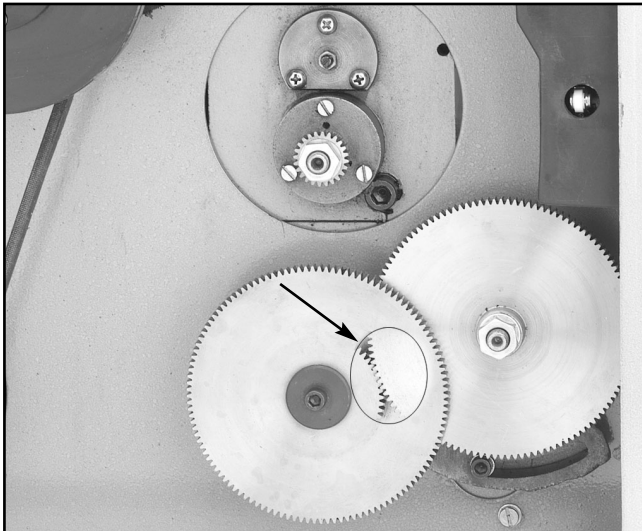


Figure 42. Cut-away shows Gear C and D in mesh.

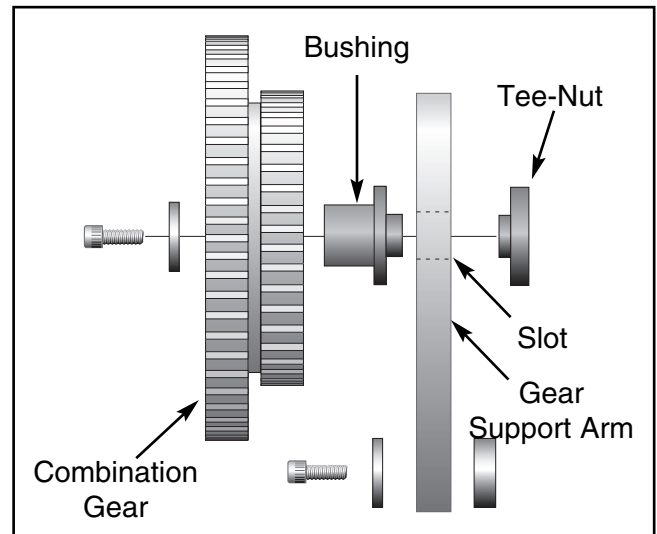


Figure 41. Flats on bushing align with slot.

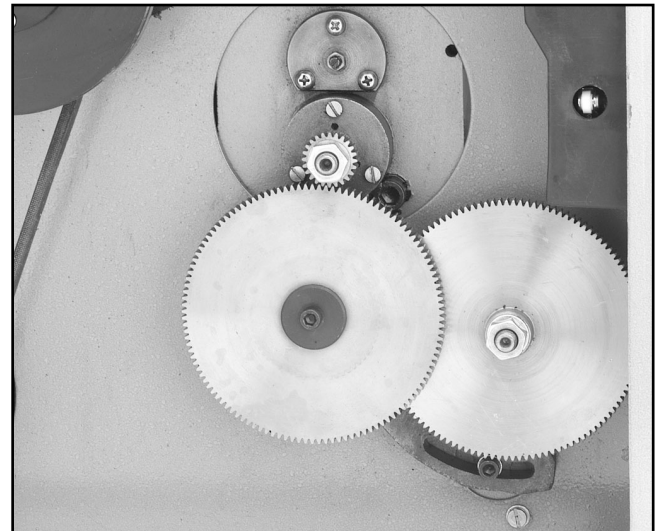


Figure 43. Gears aligned and in mesh.



Inch Threading

The inch threading gear chart is illustrated in **Figure 44**. The layout is listed below to help identify the gears needed for cutting threads with inch pitches. The chart lists pitches in threads per inch.

		N / Inch								
		24	27	30	33	36	42	48	60	
A	I	8	9	10	11	12	14	16	20	D
	II	16	18	20	22	24	28	32	40	
75	I	24	27	30	33	36	42	48	60	
	II	48	54	60	66	72	84	96	120	
25	I	24	27	30	33	36	42	48	60	
	II	48	54	60	66	72	84	96	120	

Annotations: 1 points to the thread diagram; 2 points to the gear train diagram; 3 points to the table; 4 points to the gear combination B=125, C=127.

Figure 44. Rates given in millimeters and inches.

1. The column of numbers to the right of D represent the number of teeth on gears used in position D.
2. The numbers below A represent the number of teeth on gears used in position A. In this case 25 or 75 teeth.
3. Field of possible thread pitches.
4. The gear used in position B and C will always be the 125/127 combination gear. The 125 tooth gear will need to be oriented so it is in mesh with the gear in the A position.

The Model G4015Z is capable of cutting many standard inch and metric threads. Follow the procedures listed in **Changing Gears** in the previous section and change the gears according to the chart for the thread desired. **Figures 45 - 48** show the order the gears should be installed. This example shows gearing for cutting a 10 or 20 thread per inch (tpi) screw thread. (The *Feed Rate Lever* set to the I position will allow 10 TPI. When the lever is set to the II position, 20 TPI will be cut.)

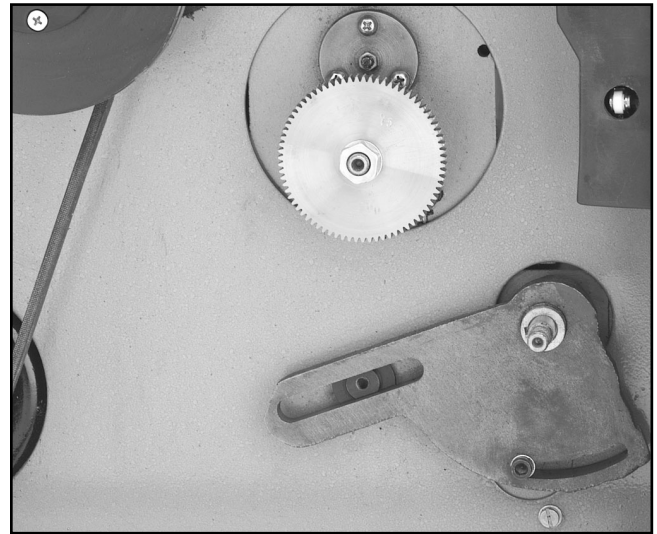


Figure 45. 75 tooth gear installed at "A".

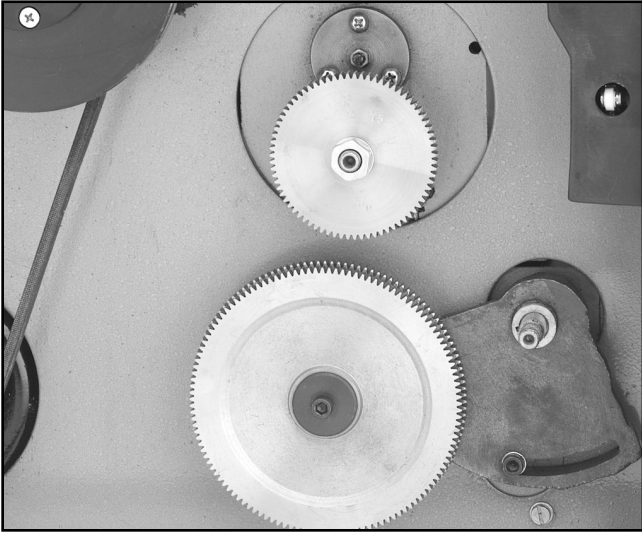


Figure 46. 125/127 tooth combination gear.

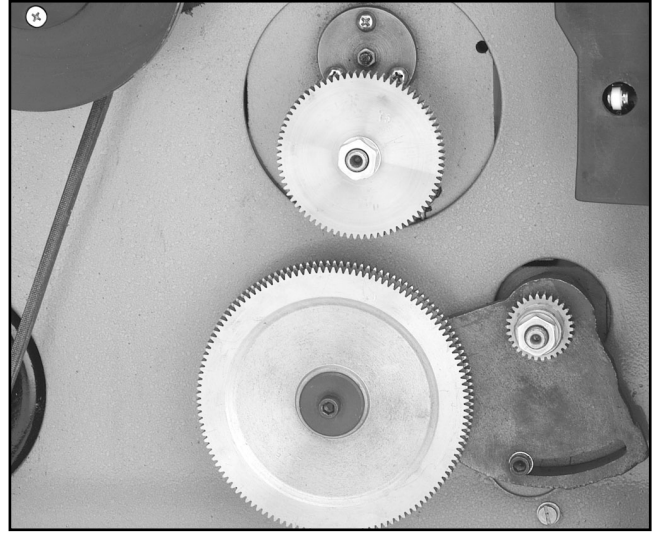


Figure 47. 30 tooth gear installed at "D".

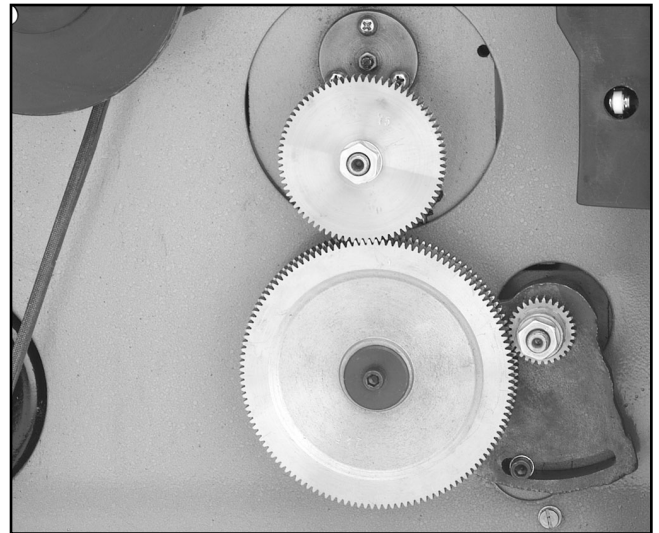


Figure 48. 30 tooth gear installed at "D".

Metric Threading

The metric threading gear chart is illustrated in **Figure 49**. The layout is listed below to help identify gears for cutting threads with metric pitches. The chart below lists threads in millimeters or the theoretical amount of space one thread occupies.

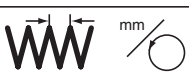
								
[1]	D	I				II		
	A	24	25	30	60	24	30	60
[2]								B=120
		24			0.4		0.4	0.2
[3]		27					0.45	
		30			0.5			0.25
		36	1.5		0.6	0.75		0.3
		42	1.75		0.7			0.35
		60	2.5	2		1.25	1	
		75		3				

Figure 49. Rates given in millimeters and inches.

Please note that charts reflect approximate apron movement per revolution.

1. The column of numbers below D represent the number of teeth on gears used in position D.
2. The numbers to the right of A represent the number of teeth on gears used in position A.
3. Field of possible thread pitches.
4. This gear will always have 120 teeth and will be intermediate to gears A and D.

Example:

To cut a thread with a pitch of 0.5 mm we would select a 60 tooth gear and place it in the A position; we would select a 30 tooth gear and place it in the D position and we would use the 60/120 combination gear. However, you will need to place the gears in position A and D so that they both contact gear B only. You can accomplish this by turning gear D so the hub is on the outside as in **Figure 50**.

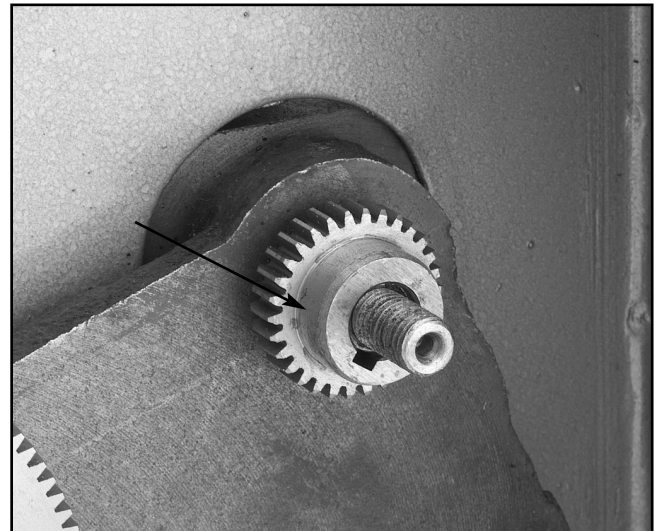
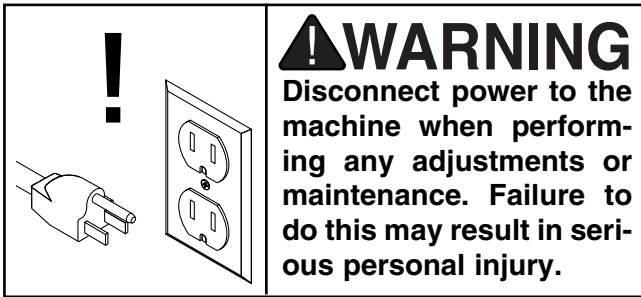


Figure 50. Gear D is turned so hub is on outside.

SECTION 10: MAINTENANCE



Lubrication

Your Model G4015Z will function best when it is clean and well lubricated. Take the time to wipe down and oil the machine before each use. We recommend using ISO 68 or SAE 20W non-detergent oil unless otherwise specified. Ball fittings will require the use of an oil gun. Depress the ball with the tip of the gun and squirt a little oil under pressure. Make sure to clean the machine after each use.

Apron and Cross slide - Apply lubrication directly to the dovetail ways of the apron and cross slide.



Figure 51. Oil ports indicated by arrows.

Compound - This slide is supplied with ball fittings on its top surface and should be oiled at the same time as the apron. **See Figure 51.**

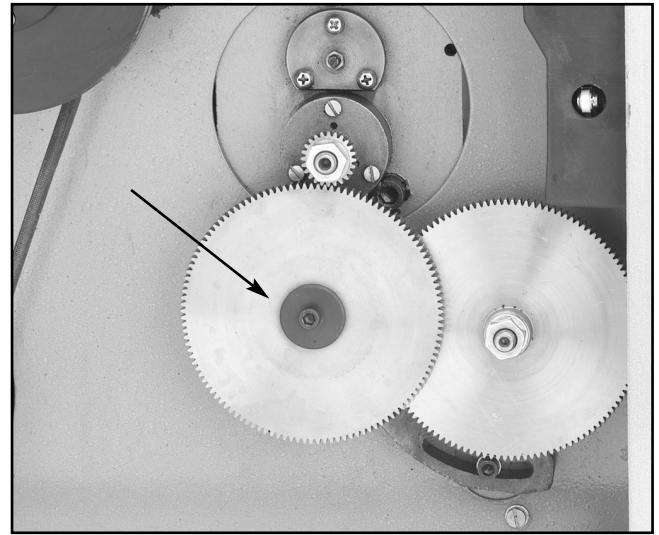


Figure 52. Oil external gears and bushing.

External Gearing - Apply only a minimal amount of oil to the teeth of the end gears after assembly or each day. Avoid getting oil on the belt or pulleys when lubricating.

Remove the gear indicated by the arrow in **Figure 52**, and apply a few drops of oil to the bushing once a day.



Figure 53. Gearbox lubrication points.

Bearings - Lubrication for the bearings occurs as the machine runs and oil circulates from the gear box. However, the bearings should be lubricated through the ball fittings indicated by the arrows in **Figure 53**. Apply oil every 3 hours of actual use and just before starting the machine each day.

Motor - The bearings used in the motor are shielded and lubricated for life, therefore, no lubrication is necessary.

Lead Screw - Be sure to clean and lubricate the *Lead Screw*. There is also a bearing on the tail stock end that will require oil.

Headstock Gearbox - The oil in the headstock should be changed after the first 2 hours of use, then every 6 months, depending on usage. We recommend that a light weight, non detergent oil be used. Viscosity can range from 10W to 30W and may include multi-viscosity oil in this same range.

To remove the oil in the gear box, remove the change gear directly under the spindle, remove the cap screw indicated in **Figure 55** and place a can under the drain hole to collect the waste oil.

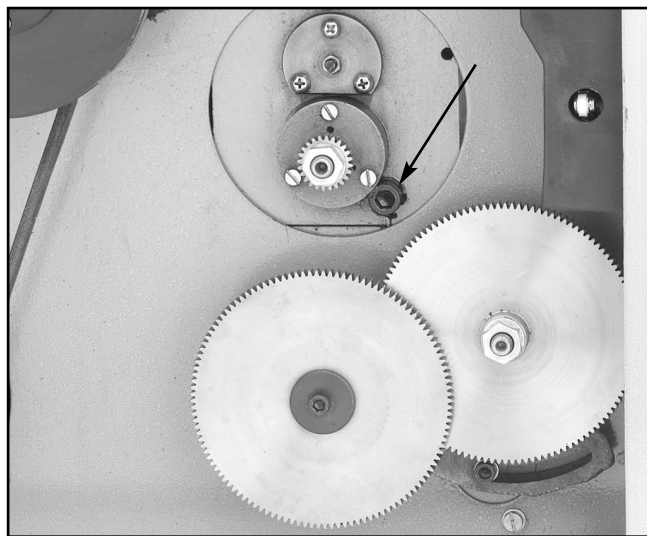


Figure 54. Remove cap screw to drain oil.

Tailstock - The tailstock is fitted with 2 oiling ports. The tailstock barrel may be oiled directly. Apply oil each week, or after every five uses (depending on the frequency of operation). Be sure to clean the slide ways for the tailstock and lift the tailstock and squirt a few drops of oil on the ways. It is a good idea to remove the tailstock, once a month and wipe the bottom thoroughly and replace. **See Figure 55.**

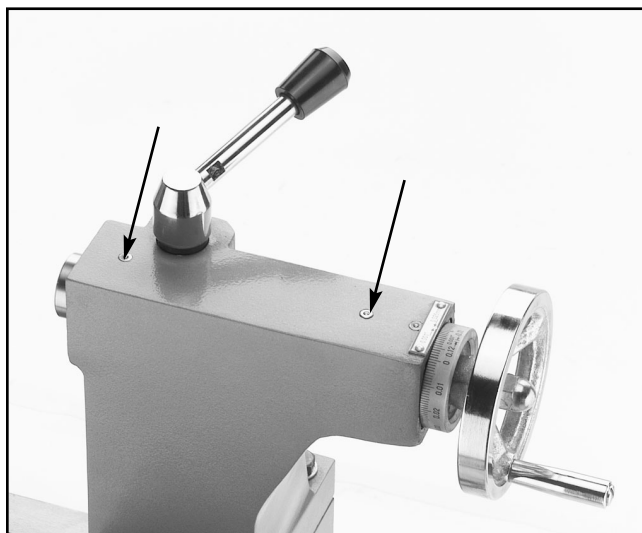


Figure 55. Tailstock oiling points.



Bearing Preload

This lathe is shipped from the factory with the bearing preload already set. If the preload requires resetting for whatever reason, please contact our service department for further instructions.



SECTION 11: CLOSURE

The following pages contain general machine data, parts diagrams, parts lists and Warranty/Return information for your Model G4015Z.

If you need parts or help in assembling your machine, or if you need operational information, we encourage you to call our Service Department. Our trained service technicians will be glad to help you. If you have comments dealing specifically with this manual, please write to our Bellingham, Washington location using the address in the Introduction section of this manual.

The specifications, drawings, and photographs illustrated in this manual represent the Model G4015Z as supplied when the manual was prepared. However, due to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. Whenever possible, though, we send manual updates to all owners of a particular tool or machine. Should you receive one, add the new information to this manual and keep it for reference.

We have included some important safety measures that are essential to this machine's operation. While most safety measures are generally universal, Grizzly reminds you that each work shop is different and safety rules should be considered *as they apply to your specific situation*.

WARNING

Operating this equipment has the potential for flying debris to cause eye injury. Always wear safety glasses or goggles when operating equipment. Everyday glasses or reading glasses only have impact resistant lenses, they are not safety glasses. Be certain the safety glasses you wear meet the appropriate standards of the American National Standards Institute (ANSI).



We recommend you keep a copy of our current catalog for complete information regarding Grizzly's warranty and return policy. If you need additional technical information relating to this machine, or if you need general assistance or replacement parts, please contact the Service Department listed in the General Information.

This machine is designed for highly-skilled individuals who have an understanding of metalworking. We realize there are numerous kinds of cutters and specialized techniques used to turn metals. To list all of the techniques necessary to operate a metal lathe correctly for specific applications would require many volumes. Additional information sources are necessary to realize the full potential of this machine. Trade journals, metalworking magazines, and your local library are good places to start.

WARNING

As with all power tools, there is danger associated with the Model G4015Z. Use the tool with respect and caution to lessen the possibility of mechanical damage or operator injury. If normal safety precautions are overlooked or ignored, injury to the operator or others in the area is likely.

NOTICE

The Model G4015Z was specifically designed for turning operations. **DO NOT MODIFY AND/OR USE THIS LATHE FOR ANY OTHER PURPOSE.** Modifications or improper use of this tool will void the warranty. If you are confused about any aspect of this machine, **DO NOT** use it until you have answered all your questions.





MACHINE DATA SHEET

Customer Service #: (570) 546-9663 • To Order Call: (800) 523-4777 • Fax #: (800) 438-5901

GRIZZLY MODEL G4015Z COMBO LATHE/MILL

Overall Dimensions:

Overall Length	42"
Overall Width	23"
Overall Height	35"
Bed Width	5½"
Spindle Bore	¾"
Lathe, Drill Press and Tailstock Tapers	#3 Morse Taper
Weight (Net)	440 lbs.
Weight (Shipping)	500 lbs.
Crate Size	40" L x 23" W x 39" H
Footprint	42" x 23"

Lathe Capacity:

Swing Over Bed	16½"
Swing Over Saddle	11½"
Distance Between Centers	19.2"
Spindle	Intrinsic 4" Back Plate
Compound Travel	3"
Cross Slide Travel	4½"
Tailstock Barrel Travel	1½"
Spindle Speeds	185, 330, 405, 535, 680, 955, 1455 R.P.M.
Feed Rate Range	8 @ .002" - .0069"
Thread Range Inch	8-120 TPI in 27 Steps (Gear changes required)
Thread Range Metric	18 @ .2 - 3.0 mm
Lead Screw	7/8"-10 TPI
Cross Slide Screw	½"-10 TPI

Drill Press Capacity: (Measured without Drill Chuck)

Swing	12"
Spindle to Bed	15¾"
Spindle Travel	3½"
Spindle to Work Table	10"
Spindle to Center line	9¾"
Head Stock Height Adjustment	3"
Range of Speeds	117, 150, 220, 276, 290, 345, 360, 440, 450, 575, 640, 836, 1000, 1300 R.P.M.
Number of Speeds	14
Drill Capacity	7/8"

Motor:

Type	TEFC Capacitor Start Induction
Horsepower	¾
Switch	Push Button, Reversing
Phase	Single Phase
Voltage	110V
Amps	8.7
R.P.M.	1710
Bearings	Shielded And Lubricated For Life

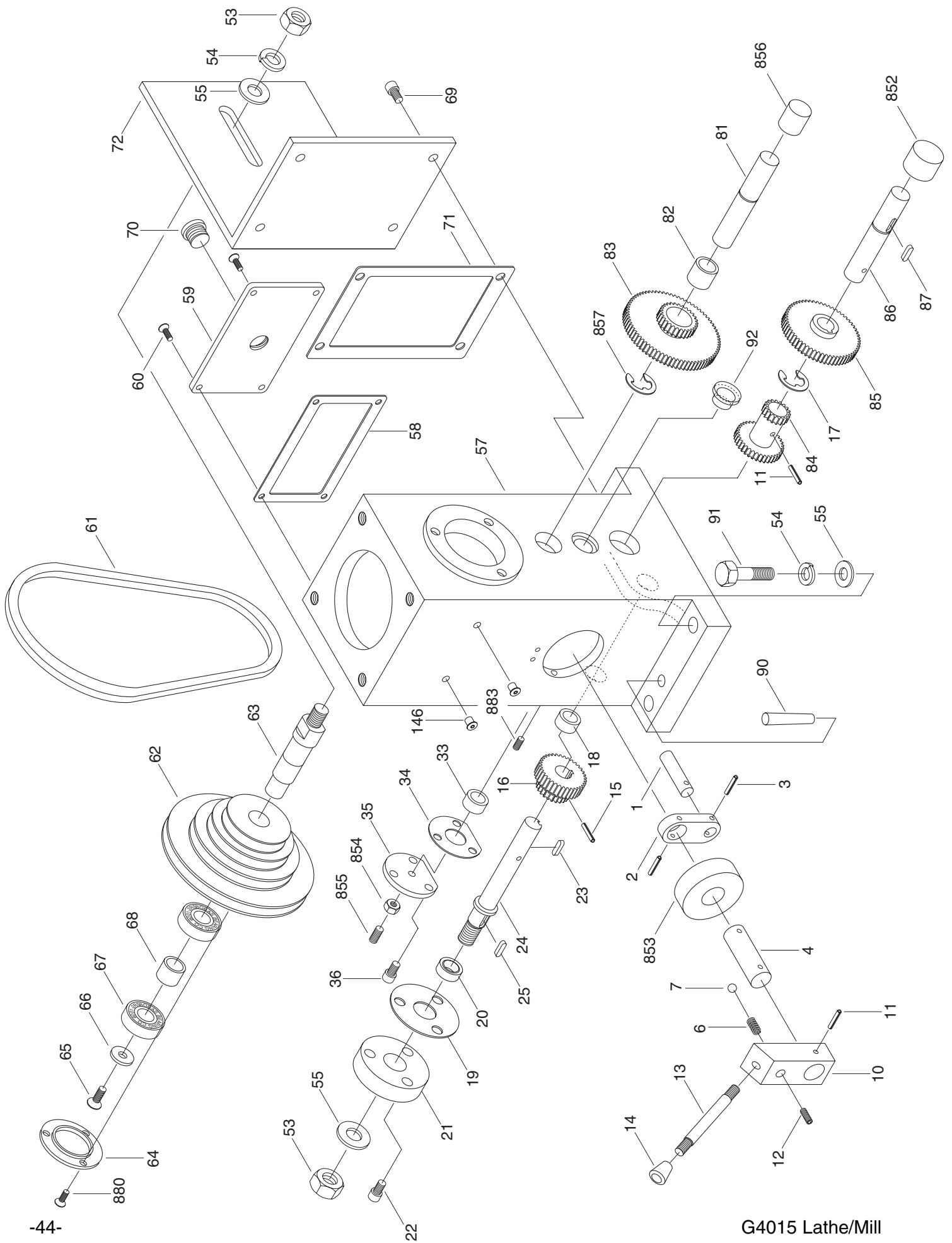
Features:

.....	4" 3-Jaw Chuck
.....	Tee Slots in Cross Slide
.....	19 Change Gears
.....	Drill Chuck with Arbor
.....	2 Dead Centers

Specifications, while deemed accurate, are not guaranteed.

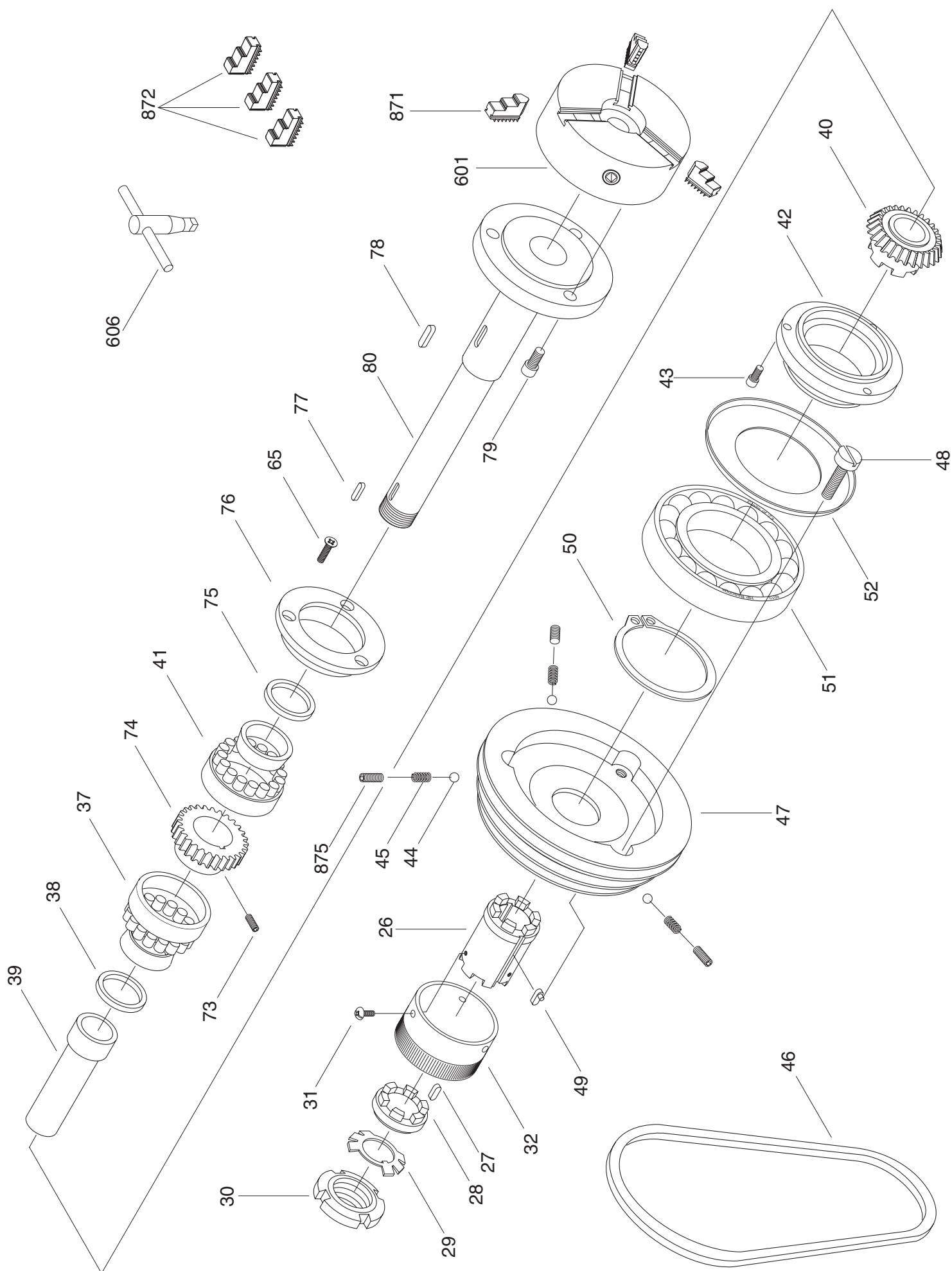
Your Notes



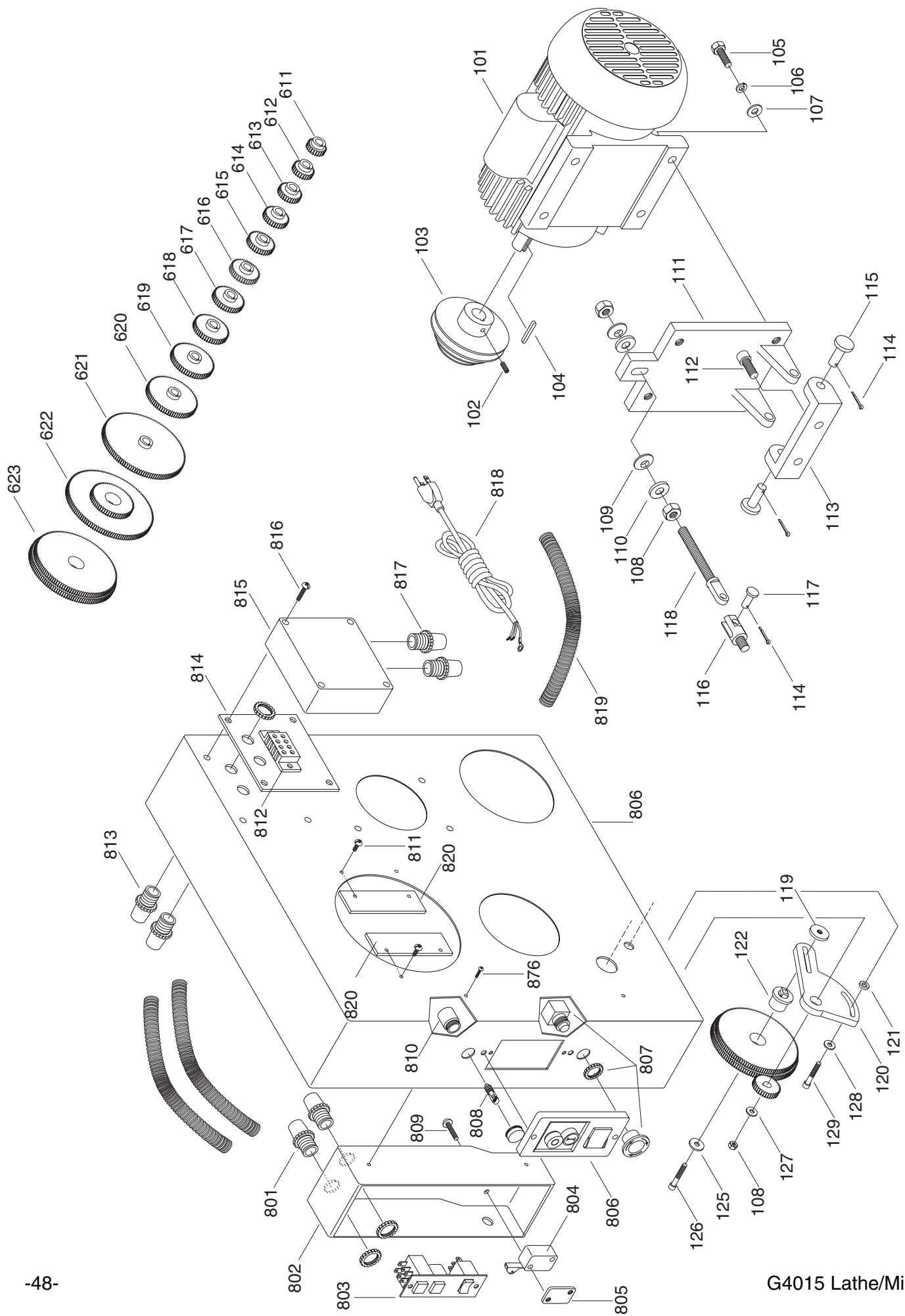


REF	PART #	DESCRIPTION
001	P4015Z001	PIN 8 X 30
002	P4015Z002	LINK BOARD
003	P4015Z003	SPRING PIN
004	P4015Z004	PIN 12 X 40
006	P4015Z006	SPRING
007	P4015Z007	STEEL BALL 5MM
010	P4015Z010	LEVER BASE
011	PRP03M	ROLL PIN 5 X 20
012	PSS14M	SETSCREW M8-1.25 X 12
013	P4015Z013	LEVER
014	P4015Z014	KNOB
015	PRP44M	ROLL PIN 3 X 10
016	P4015Z016	DUPLEX GEAR
017	PR03M	EXT RET RING 12MM
018	P4015Z018	SLEEVE
019	P4015Z019	PAPER WASHER
020	P4015Z020	OIL SEAL
021	P4015Z021	OIL SEAL BOARD
022	PSB15M	CAP SCREW M5-.8 X 20
023	PK34M	KEY 5 X 5 X 20
024	P4015Z024	SHAFT
025	PK05M	KEY 4 X 4 X 10
033	P4015Z033	SLEEVE
034	P4015Z034	PAPER WASHER
035	P4015Z035	COVER
036	PSB50M	CAP SCREW M5-.8 X 10
053	PN08M	HEX NUT M10-1.25
054	PLW06M	LOCK WASHER M10
055	PW03	FLAT WASHER #10
057	P4015Z057	HOUSING
058	P4015Z058	SEAL RING
059	P4015Z059	COVER

REF	PART #	DESCRIPTION
060	PFH07M	FLAT HD SCR M5-.8 X 8
061	P4015Z061	V-BELT 710
062	P4015Z062	PULLEY
063	P4015Z063	SHAFT
064	P4015Z064	COVER
065	PS07M	PHLP HD SCR M4-.7 X 8
066	PW05M	FLAT WASHER M4
067	P4015Z067	BEARING 1000900
068	P4015Z068	COLLAR
069	PSB26M	CAP SCREW M6 X 12
070	P4015Z070	OIL COVER
071	P4015Z071	PAPER WASHER
072	P4015Z072	PULLEY BRACKET
081	P4015Z081	SHAFT
082	P4015Z082	SLEEVE
083	P4015Z083	DUPLEX GEAR
084	P4015Z084	DUPLEX GEAR
085	P4015Z085	GEAR
086	P4015Z086	SHAFT
087	PK19M	KEY 5 X 5 X 14
090	P4015Z090	PIN
091	PB31M	HEX BOLT M10-1.5 X 40MM
092	P4015Z092	OIL WINDOW
146	P4015Z146	OILER 6MM
852	P4015Z852	END BUSHING
853	P4015Z853	SHIFT BRACKET
854	P4015Z854	HEX NUT
855	P4015Z855	SETSCREW
856	P4015Z856	END BUSHING
857	P4015Z857	E CLIP
880	PFH07M	FLAT HD SCR M5-.8 X 10
883	P4015Z883	SLOTTED SCREW

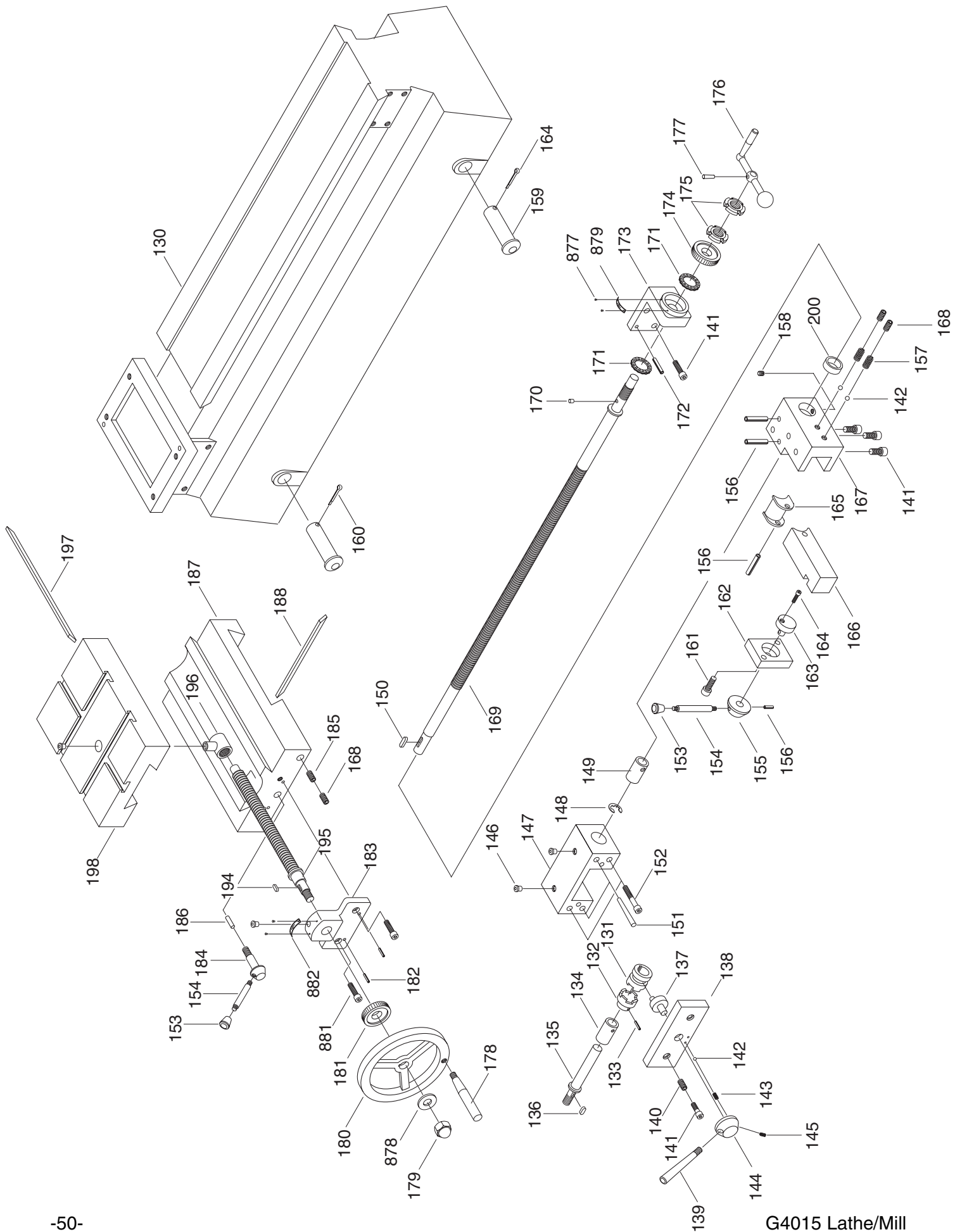


REF	PART #	DESCRIPTION
026	P4015Z026	CLUTCH
027	PK40M	KEY 8 X 8 X 12
028	P4015Z028	CLUTCH
029	P4015Z029	TAB WASHER 30
030	P4015Z030	ROUND NUT
031	PSS26M	SETSCREW M5-.8 X 6
032	P4015Z032	HANDLE KNOB
037	P4015Z037	BEARING D2007107
038	P4015Z038	COMP WASHER
039	P4015Z039	SLEEVE
040	P4015Z040	BEVEL GEAR
041	P4015Z041	BEARING
042	P4015Z042	BEARING PEDESTAL
043	PSB38M	CAP SCREW M5-.8 X 30
044	P4015Z044	STEEL BALL M5
045	P4015Z045	SPRING
046	P4015Z046	V-BELT 630
047	P4015Z047	PULLEY
048	PSB04M	CAP SCREW M6-1 X 8
049	P4015Z049	T-KEY
050	P4015Z050	CIRCLIP
051	P6013	BALL BEARING 6013
052	P4015Z052	BEARING PEDESTAL
065	PS07M	PHLP HD SCREW M4 X 8
073	PSS05M	SET SCREW M5-.8 X 10
074	P4015Z074	GEAR
075	P4015Z075	SEAL WASHER
076	P4015Z076	BEARING WASHER
077	PK40M	KEY 8 X 8 X 12
078	PK51M	KEY 8 X 8 X 22
079	PSB26M	CAP SCREW M6 X 12
080	P4015Z080	SPINDLE
601	P4015Z601	3-JAW CHUCK
606	P4015Z606	CHUCK KEY
871	P4015Z871	INT CHUCK JAW (3)
872	P4015Z872	EXT CHUCK JAW (3)



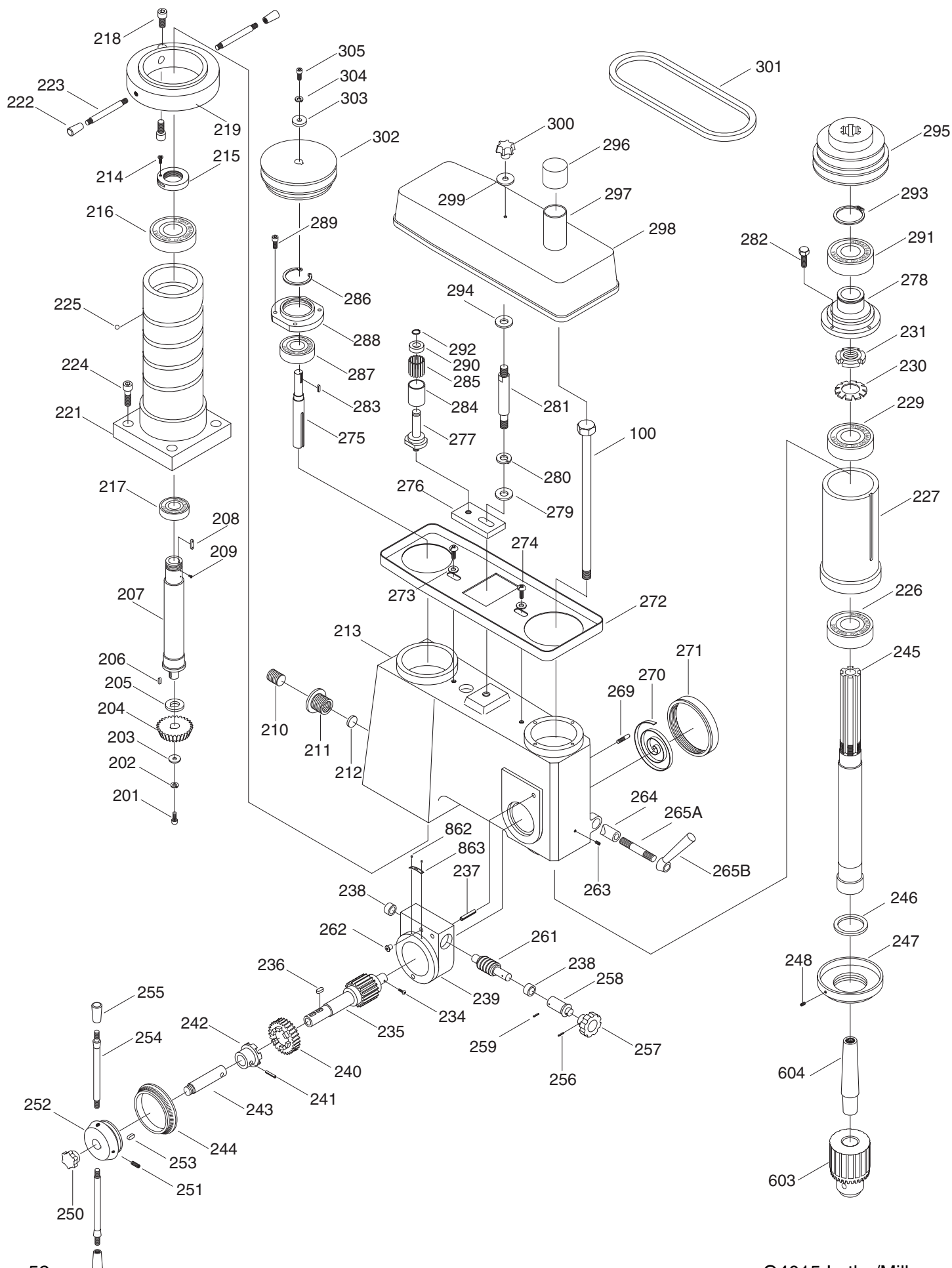
REF	PART #	DESCRIPTION
101	P4015Z101	MOTOR
102	PSS20M	SET SCREW M8-1.25 X 8
103	P4015Z103	PULLEY
104	PK23M	KEY 5 X 5 X 25
105	PB07M	HEX BOLT M8-1.25 X 25
106	PLW04M	LOCK WASHER 8MM
107	PW01M	FLAT WASHER 8MM
108	PN02M	HEX NUT M10-1.5
109	P4015Z109	BALL FACE WASHER
110	P4015Z110	CONE FACE WASHER
111	P4015Z111	MOTOR PEDESTAL
112	PSB11M	CAP SCREW M8-1.25 X 16
113	P4015Z113	MOTOR BRACKET
114	PRP02	ROLL PIN 3 X 16
115	P4015Z115	PIN
116	P4015Z116	MOVABLE JOINT
117	P4015Z117	PIN
118	P4015Z118	BOLT
119	P4015Z119	T-KEY
120	P4015Z120	GEAR BRACKET
121	PW03M	FLAT WASHER
122	P4015Z122	T-COLLAR
125	PW03M	FLAT WASHER 6MM
126	PSB29M	CAP SCREW M6-1 X 40
127	PW03	FLAT WASHER 6MM
128	PW16	FLAT WASHER #6
129	PSB07M	CAP SCREW M6-1 X 30
611	P4015Z611	CHANGE GEAR 24
612	P4015Z612	CHANGE GEAR 25
613	P4015Z613	CHANGE GEAR 27
614	P4015Z614	CHANGE GEAR 30
615	P4015Z615	CHANGE GEAR 33
616	P4015Z616	CHANGE GEAR 36
617	P4015Z617	CHANGE GEAR 42
618	P4015Z618	CHANGE GEAR 48
619	P4015Z619	CHANGE GEAR 60
620	P4015Z620	CHANGE GEAR 75
621	P4015Z621	CHANGE GEAR 120
622	P4015Z622	DUPLEX GEAR 60/120T
623	P4015Z623	DUPLEX GEAR 125/127T

REF	PART #	DESCRIPTION
801	P4015Z801	STRAIN RELIEF
802	P4015Z802	PLASTIC HOUSING
803	P4015Z803	SWITCH ASSEMBLY
804	P4015Z804	SAFETY SWITCH
805	P4015Z805	SPACER
806	P4015Z806	SWITCH COVER
807	P4015Z807	STOP/RESET SWITCH
808	P4015Z808	INDICATOR LIGHT
809	PS25M	PHLP HD SCR M4-.7 X 34
810	P4015Z810	LIGHT HOLDER
811	PS07M	PHLP HD SCR M4-.7 X 8
812	P4015Z812	CONNECTION BUS
813	P4015Z813	STRAIN RELIEF
814	P4015Z814	MOUNTING BRACKET
815	P4015Z815	COVER
816	PS36M	PHLP HD SCR M4-.7 X 30
817	P4015Z817	STRAIN RELIEF
818	PWRCRD110L	POWER CORD 110V LONG
819	P4015Z819	FLEXABLE CONDUIT
820	P4015Z820	GUARD PLATE
876	P4015Z876	WOOD SCREW M4 X 12



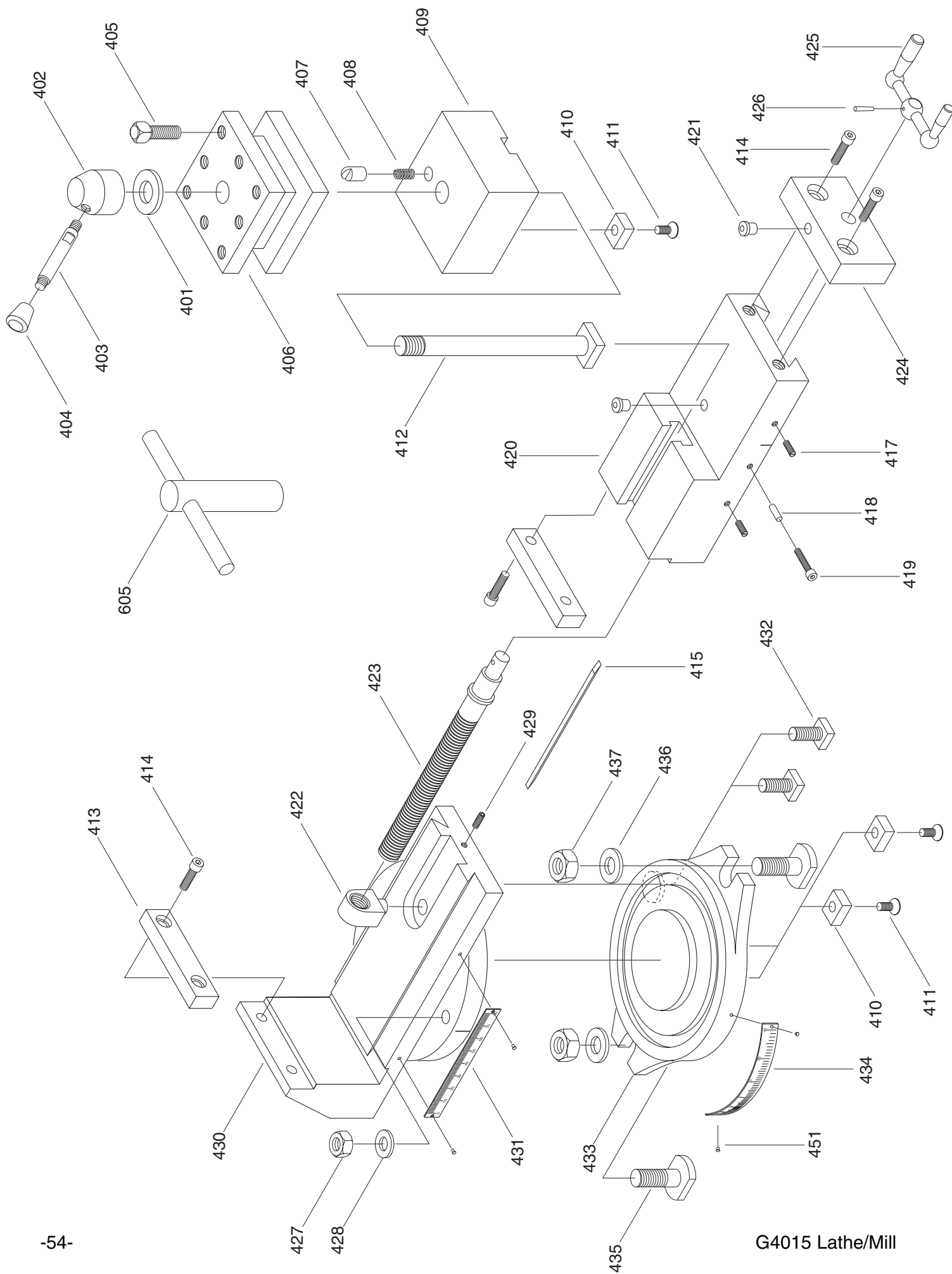
REF	PART #	DESCRIPTION
130	P4015Z130	BODY
131	P4015Z131	CLUTCH B
132	P4015Z132	CLUTCH A
133	PRP25M	ROLL PIN 5 X 21
134	P4015Z134	SLEEVE (LEFT)
135	P4015Z135	SHAFT
136	PK05M	KEY 4 X 4 X 12
137	P4015Z137	ECCENTRIC PIN
138	P4015Z138	COVER
139	P4015Z139	LEVER
140	PSS03M	SET SCREW M6-1 X 12
141	PSB26M	HEX BOLT M8-1.25 X 42
142	P4015Z142	STEEL BALL 6.5
143	P4015Z143	SPRING
144	P4015Z144	LEVER BASE
145	PSS11M	SET SCREW M6-1 X 16
146	P4015Z146	OILER
147	P4015Z147	LINK BASE
148	P4015Z148	E RING
149	P4015Z149	SLEEVE (RIGHT)
150	PK01M	KEY 5 X 5 X 12
151	P4015Z151	PIN
152	PSB37M	CAP SCREW M6-1.0 X 50
153	P4015Z153	KNOB
154	P4015Z154	LEVER
155	P4015Z155	LEVER BASE
156	P4015Z156	SPRING PIN
157	P4015Z157	SPRING
158	PSS17M	SET SCREW M8-1.25 X 6
159	P4015Z159	LIFTING PIN
160	PRP10M	ROLL PIN 5 X 36
161	PSB33M	CAP SCREW M5-.8 X 12
162	P4015Z162	COVER
163	P4015Z163	PIN BASE
164	P4015Z164	PIN

REF	PART #	DESCRIPTION
165	P4015Z165	HALF NUT
166	P4015Z166	HALF NUT BASE
167	P4015Z167	HALF NUT BRACKET
168	PSS14M	SET SCREW M8-1.25 X 12
169	P4015Z169	LONG LEAD SCREW
170	P4015Z170	STEEL PIN
171	P8103	THRUST BEARING 8103
172	P4015Z172	CONE PIN
173	P4015Z173	LEAD SCREW BRACKET
174	P4015Z174	SCALE RING
175	P4015Z175	ROUND NUT
176	P4015Z176	BALL CRANK HANDLE
177	P4015Z177	TAPER PIN
178	P4015Z178	LEVER
179	P4015Z179	ACORN NUT
180	P4015Z180	HANDWHEEL
181	P4015Z0181	SCALE RING
182	PRP06M	ROLL PIN 5 X 24
183	P4015Z183	LEAD SCREW BRACKET
184	P4015Z184	HANDLE SCREW
185	PSS16M	SCREW M8-1.25 X 10
186	P4015Z186	LOCKING PIN
187	P4015Z187	LONGITUDINAL SLIDE
188	P4015Z188	GIB
194	PK48M	KEY 4 X 4 X 20
195	P4015Z195	CROSS LEAD SCREW
196	P4015Z196	CROSS SLIDE NUT
197	P4015Z197	GIB
198	P4015Z198	CROSS SLIDE
877	P4015Z877	RIVET
878	PW04M	FLAT WASHER 10MM
879	P4015Z879	INDEX
881	PSB11M	CAP SCR M8-1.25 X 16
882	P4015Z882	INDEX



REF	PART #	DESCRIPTION
100	P4015Z100	DRAW BAR
200	P4015Z200	LEAD SCREW SLEEVE
201	PSB24M	CAP SCREW M5-.8 X 16
202	PW02M	FLAT WASHER 5MM
203	P4015Z203	CIRCLIP
204	P4015Z204	BEVEL GEAR
205	P4015Z205	COMP WASHER
206	PK07M	KEY 6 X 6 X 14
207	P4015Z207	DRIVING SHAFT
208	PK43M	KEY 8 X 8 X 45
209	PFH07M	FL HD SCREW M5-.8 X 10
210	P4015Z210	SET SCREW M16 X 20
221	P4015Z211	LOCK BOLT SEAL
212	P4015Z212	LOCKING PIN
213	P4015Z213	DRILL/MILL HOUSING
214	PFH07M	FL HD SCREW M5-.8 X 10
215	P4015Z215	NUT
216	P6007	BALL BEARING 6007
217	P6008	BALL BEARING 6008
218	PSB04M	CAP SCREW M6-1 X 10
219	P4015Z219	PLATE
221	P4015Z221	ROTATION BASE
222	P4015Z222	KNOB
223	P4015Z223	LEVER
224	PSB13M	CAP SCREW M8-1.25 X 30
225	P4015Z225	STEEL BALL
226	P4015Z226	BEARING 2007107
227	P4015Z227	HOLLOW SHAFT
229	P4015Z229	BEARING 2007106
230	P4015Z230	LOCK WASHER
231	P4015Z231	NUT M30-1.5
232	PSS09M	SET SCREW M8-1.25 X 30
234	PSS08M	SET SCREW 4-.7 X 5
235	P4015Z235	GEAR SHAFT
236	PK07M	KEY 6 X 6 X 14
237	PSS03M	SET SCREW M6-1 X 8
238	P4015Z238	COLLAR
239	P4015Z239	FEED BOX HOUSING
240	P4015Z240	WORM GEAR
241	PRP27M	ROLL PIN 5 X 28
242	P4015Z242	CLUTCH
243	P4015Z243	PIN
244	P4015Z244	SCALE RING
245	P4015Z245	DRILL/MILL SHAFT
246	P4015Z246	SEAL
247	P4015Z247	DRILL/MILL SHAFT GLAND
248	PSS05M	SET SCREW M5-.8 X 10
250	P4015Z250	LEVER
251	PSS11M	SET SCREW M6-1 X 18
252	P4015Z252	COLLAR
253	P4015Z253	SPRING LEAF
254	P4015Z254	LEVER

REF	PART #	DESCRIPTION
255	P4015Z255	KNOB
256	PRP16M	ROLL PIN 3 X 25
257	P4015Z257	KNOB
258	P4015Z258	LEVER
259	P4015Z259	PIN
261	P4015Z261	WORM SHAFT
262	P4015Z262	OILER
263	PSS06M	SET SCREW M8-1.25 X 15
264	P4015Z264	COMP WASHER
265A	P4015Z265A	STUD
265B	P4015Z265B	LOCK LEVER
268	P4015Z268	SPRING HOUSING
269	PSS24M	SET SCREW M5-.8 X 25
270	P4015Z270	SPRING
271	P4015Z271	SPRING HOUSING COVER
272	P4015Z272	PULLEY SHELL (BOTT)
273	PW08	FLAT WASHER #8
274	PS16M	PHLP HD SCR M8-1.25 X 12
275	P4015Z275	SHAFT
276	P4015Z276	TIGHTENER BOARD
277	P4015Z277	TIGHTENER SHAFT
278	P4015Z278	PULLEY BRACKET
279	PW01M	FLAT WASHER 8MM
280	PLW04M	LOCK WASHER 8MM
281	P4015Z281	SHELL BOLT
282	PB16M	HEX BOLT M5-.8 X 24
283	PK23M	KEY 5 X 5 X 25
284	P4015Z284	BELT TIGHTENER
285	P4015Z285	ROLLER
286	PR24M	INT RET RING 42MM
287	P6104	BALL BEARING 6104
288	P4015Z288	BEARING BRACKET
289	PSB24M	CAP SCREW M5-.8 X 16
290	P4015Z290	COLLAR
291	P6108	BALL BEARING 6108
292	PR01M	EXT RET RING 10MM
293	PR34M	EXT RET RING 40MM
294	PW01M	FLAT WASHER 8MM
295	P4015Z295	PULLEY
296	P4015Z296	COVER
297	P4015Z297	PIPE
298	P4015Z298	PULLEY SHELL (TOP)
299	PW01M	FLAT WASHER 8MM
300	P4015Z300	KNOB
301	PVM29	V-BELT 29M
302	P4015Z302	PULLEY
303	P4015Z303	WASHER
304	PLW01M	LOCK WASHER 5MM
305	PSB15M	CAP SCREW M5-.8 X 20
603	P4015Z603	DRILL CHUCK
604	P4015Z604	DRILL CHUCK ARBOR



REF	PART #	DESCRIPTION
401	P4015Z401	WASHER
402	P4015Z402	LOCKING HUB
403	P4015Z403	LEVER
404	P4015Z404	KNOB
405	P4015Z405	SQUARE HEAD BOLT
406	P4015Z406	TOOL POST
407	P4015Z407	HOLLOW SET PIN
408	P4015Z408	SPRING
409	P4015Z409	TOOL POST BASE
410	P4015Z410	KEY
411	PS02M	PHLP HD SCR 4-.7 X 12
412	P4015Z412	TOOL POST BOLT
413	P4015Z413	CHELA
414	PSB26M	CAP SCREW M6-1 X 12
415	P4015Z415	GIB
417	PSS24M	SET SCREW M5-.8 X 25
418	P4015Z418	LOCKING PIN
419	PSB09M	CAP SCREW M5-.8 X 17
420	P4015Z420	UPSLIDE
421	P4015Z421	OILER
422	P4015Z422	LEAD SCREW NUT
423	P4015Z423	LEAD SCREW
424	P4015Z424	LEAD SCREW BRACKET
425	P4015Z425	LEVER
426	PRP02M	ROLL PIN 3 X 16
427	PN03M	HEX NUT M8-1.25
428	PW01M	FLAT WASHER 8MM
429	PSS31M	SET SCREW M5-.8 X 8
430	P4015Z430	DOWN SLIDE
431	P4015Z431	SCALE
432	P4015Z432	T-BOLT
433	P4015Z433	BASE
434	P4015Z434	SCALE
435	P4015Z435	T-BOLT
436	PW04M	FLAT WASHER 10MM
437	PN02M	HEX NUT M10-1.5
451	P4015Z451	RIVET
605	P4015Z605	TOOL POST WRENCH

REF	PART #	DESCRIPTION
153	P4015Z153	KNOB
154	P4015Z154	LEVER
155	P4015Z155	LOCK HUB
179	P4015Z179	ACORN NUT
189	P4015Z189	LOCK PIN
190	PSS06M	SET SCREW M8-1.25 X 16
191	PSS21M	SETSCREW M8-1.25 X 25
192	P4015Z192	TAILSTOCK BASE
193	P4015Z193	GIB
541	P4015Z541	TAILSTOCK BODY
543	PB31M	HEX BOLT M10-1.5 X 40
544	PSS23M	SETSCREW M4-.7 X 8
545	P4015Z545	T-KEY
546	P4015Z546	TAILSTOCK BARREL
547	P4015Z547	FEED NUT
548	P4015Z548	OIL CUP
549	P4015Z549	LOCK BUSHING (BOTT)
550	P4015Z550	LOCK BUSHING (TOP)
551	P4015Z551	DOUBLE SCREW BOLT
552	PW04M	FLAT WASHER 10MM
553	P4015Z553	LOCK NUT
554	P4015Z554	LOCK LEVER
555	P4015Z555	KNOB
556	P4015Z556	BRACKET
557	P4015Z557	DIAL
558	P4015Z558	HAND WHEEL
559	PW04M	FLAT WASHER 10MM
561	P4015Z561	HANDLE
563	PK37M	KEY 4 X 4 X 18
564	P4015Z564	FEED SCREW
565	P4015Z565	ROLL PIN
566	P4015Z566	COLLAR
602	P4015Z602	CENTER
608	PAW04M	ALLEN WRENCH 4MM
609	PAW05M	ALLEN WRENCH 5MM
610	PAW08M	ALLEN WRENCH 8MM
651	P4015Z651	FLAT WASHER
652	P4015Z652	INDICATOR
653	P4015Z653	ADJUSTING STUD
654	P4015Z654	KEY
655	P4015Z655	SETSCREW
656	P4015Z656	SCALE
657	P4015Z657	RIVET
658	P4015Z658	INDICATOR

WARRANTY AND RETURNS

Grizzly Imports, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

WARRANTY CARD

NAME _____ PHONE NUMBER _____
STREET _____
CITY _____ STATE _____ ZIP _____
MODEL# G4015 Lathe/Mill INVOICE# _____ SERIAL# _____

The following information is given on a voluntary basis. This information will be used for marketing purposes to help Grizzly develop better products. Your name will be included in our mailing **list** only. It will not be sold to other companies. of course, all information is strictly confidential.

1. How did you find out about us?

☐ Advertisement ☐ Friend ☐ Website
☐ Catalog ☐ Card deck ☐ Other _____

2. Do you think your machine represents good value? ☐ YES ☐ NO

3. Would you allow us to use your name as a reference for Grizzly customers in your area? ☐ YES ☐ NO
(Note: Your **name** will be used a maximum of three **times**.)

4. To which of the following publications do you subscribe? Check all that apply.

☐ Home Shop Machinist ☐ Rifle Magazine Other _____
☐ Projects in Metal ☐ Hand Loader Magazine
☐ Modeltec ☐ Precision Shooter
☐ Live Steam ☐ RC Modeler
☐ Shotgun News ☐ Model Airplane News

5. What is your annual household income?

☐ \$20,000-\$30,000 ☐ \$50,001-\$60,000 ☐ \$80,000-\$90,000
☐ \$30,001-\$40,000 ☐ \$60,001-\$70,000 ☐ +\$90,000
☐ \$40,001-\$50,000 ☐ \$70,001-\$80,000

6. To which age group do you belong?

☐ 20-30 ☐ 41-50 ☐ 61-70
☐ 31-40 ☐ 51-60 ☐ +70

7. Which of the following machines or accessories do you own? Check all that apply.

☐ Engine Lathe ☐ Abrasive Cutoff ☐ Sheet Metal Machine
☐ Band Saw (Metal) ☐ Arc Welder ☐ Other _____
☐ Band Saw (Wood) ☐ Oxy/Ac. Outfit
☐ Milling Machine ☐ Air Compressor
☐ Bench Grinder ☐ Drill Press

8. How many of the machines you checked in Question 7 are Grizzly machines? _____

9. Which of the following tooling and accessories do you own? Check all that apply.

☐ Milling Vises ☐ Collet Closer ☐ Digital Readout
☐ Indexing Head ☐ Taper Attachment ☐ Tool Post Grinder
☐ Rotary Table ☐ Boring Head ☐ Other _____

10. In the space below, list three tools you would like Grizzly to carry.

11. Of all the mail order metalworking company's you have purchased from, how do you rate Grizzly in terms of overall customer satisfaction?

☐ The best ☐ Above average ☐ Average
☐ Below average ☐ The worst

12. Comments _____

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